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BLUE JAY

Volume 66 Number 4 December 2008

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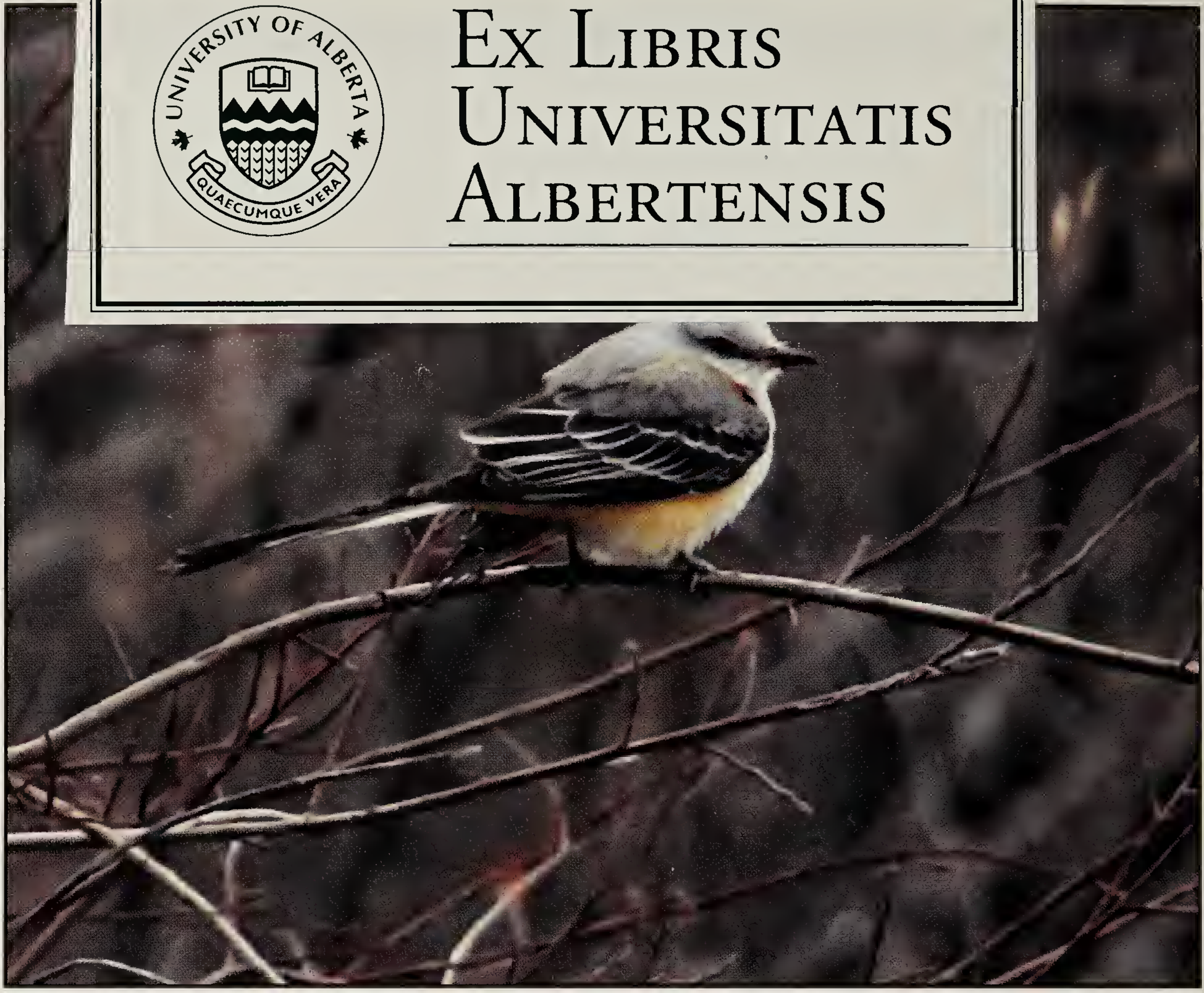

Blue Jay

Vol. 66 No. 4 December 2008

Nature

FIELD SKETCHES: BOHEMIAN WAXWINGS. *Paul Geraghty* 202

MULE DEER.*Paul Geraghty* 238

Editors' Message 195

Birds

RECENT CATTLE EGRET BREEDING RECORDS FOR THE LAST MOUNTAIN LAKE AREA, SK. *Kerry Hecker and Philip S. Taylor* 196

AN EXTRAORDINARY RAVEN NEST. *Peter Taylor* 203

RAPTORS NESTING IN WASCANA PARK, REGINA. *Jared B. Clarke* 206

SPRING 2008 - A DEVASTATING TIME FOR MOUNTAIN BLUEBIRDS ON THE PRAIRIES. *Lois M. Johnson* 209

Plants

THE SALTBUSHES (*ATRIPLEX*) OF THE PRAIRIE PROVINCES. *Diana Bizecki Robson* 211

Insects

RESULTS OF THE 2008 INTERNATIONAL BUTTERFLY COUNT IN SASKATCHEWAN. *Mike Gollop and Anna Leighton* 226

Nature Library

ECOLOGY, CONSERVATION, AND STATUS OF REPTILES IN CANADA. *Carolyn N. L. Seburn and Christine A. Bishop (eds.)* 233

Poetry

DISPLACEMENT. *Victor C. Friesen* 225

DEER. *Victor C. Friesen* 236

Nature Saskatchewan News 239

Mystery Photo 241

Index to Volume 66. *Teresa Dolman* 242

__Front cover__: Snowshoes *Wayne Lynch*

__Back cover__: Atypical, scarlet leaves of Trembling Aspen (Populus tremuloides), 3 October 2008, near Bjorkdale, SK *John Kozial*

***Inside front cover**:*
top: Scissor-tailed Flycatcher near Blackstrap Lake south of Saskatoon on 3 November 2008 *Nick Saunders*

bottom: Bearberry (Arctostaphylos uva-ursi) in fruit in Manitoba *Ardythe MacMaster*

***Inside back cover**:*
top: Garden Orache (Atriplex hortensis) near Saskatoon *Jim Romo*

bottom: Figure 2. Two Cattle Egrets at Stalwart NWA with buffy plumes on back of head. (See article on page 196) *Kerry Hecker, EC - CWS*

Close-up of male Polyphemus Moth antennae *John Kozial*

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EDITORS' MESSAGE

It's time for the year-end thank you to the people who help make *Blue Jay* what it is, and this time, we extend our gratitude to nearly a decade of submissions and assistance during the course of our term as editors. After nine years in the editor's seat, we are stepping aside to give new people the privilege of editing this fine and unique publication, and to give the publication a chance to stretch its legs in new directions. We've enjoyed all aspects of the job immensely–the work, the people, and the Society–and look forward to becoming avid recreational readers and future contributors.

The new editors, Vicky Kjoss (pronounced 'chus' as in Massa**chus**etts) and Chris Somers (pronounced 'summers'), are a Regina couple who will be starting their term as editors with the March 2009 issue. We are delighted to be turning the publication over to this new team. The email address for contributions to the March and subsequent issues is <kjoss@sasktel.net>.

We wish Vicky and Chris good luck with their new job, and an enjoyable term as editors. And to all of you who have worked with us over the last nine years, many, MANY thanks; we have greatly appreciated your generous contributions and willing assistance. We also want to acknowledge the importance of the readers, whose interest in regional natural history gives *Blue Jay* its purpose.

Anna and Ted Leighton, Editors

* * *

"The Solstice past, the year tends toward spring. But you would never know it. The old saying, 'Days lengthen, cold strengthens,' is proved in January. But it is a good time to study snowflakes. I go out wearing a dark coat or carrying a piece of black cloth and catch a few flakes and examine them first with the naked eye, then under the glass." Hal Borland, *Beyond Your Doorstep*, p. 354.

"Take long walks in stormy weather or through deep snows in the fields and woods, if you would keep your spirits up. Deal with brute nature. Be cold and hungry and weary." -Henry David Thoreau, naturalist and author (1817-1862)

BIRDS

RECENT CATTLE EGRET BREEDING RECORDS FOR THE LAST MOUNTAIN LAKE AREA, SK

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During the summer of 2005, Cattle Egrets successfully bred at Stalwart National Wildlife Area (NWA) near Stalwart, SK. This was the third breeding record for Cattle Egrets in Saskatchewan; the two earlier records were of single pairs at Old Wives' Lake Migratory Bird Sanctuary in 1981, and Eyebrow Lake in 1994.[6, 7, 8] Subsequent to 2005, Cattle Egret nests were found in Saskatchewan at Middle Quill and Goose Lakes,[2] and in a marsh north of Last Mountain Lake National Wildlife Area but the 2005 record remains the only nesting record for Stalwart NWA. This record was mentioned briefly in previous articles.[2,4] Here we provide details of that event and additional observations of this species' recent nesting efforts in the area.

Stalwart NWA (Figure 1) consists of a large marsh just east of Highway #2 adjacent to the hamlet of Stalwart (51 40 N; 105 28 W). The area is an important stopover for migrating waterfowl and shorebirds, as well as a highly productive breeding marsh for many water dependent birds including colonial nesting species like Eared Grebe, Black-crowned Night-Heron, and Franklin's Gull.

2005

On 2 June 2005, D. Duncan (Environment Canada, Canadian Wildlife Service, Edmonton) visited Stalwart NWA and saw one small, white, heron-like bird, carrying a strand of vegetation in its beak, fly up from the east-west grid road that runs through the north part of the Stalwart NWA. He tentatively identified it as a Cattle Egret and reported to the CWS staff at Last Mountain Lake National Wildlife Area (LMLNWA) that it might be nesting.

Subsequent visits by the second author (PST), and later by both of us, found the egrets flying to and from, and landing in, an area of reeds and grass, comprised primarily of bulrush *Scirpus sp*. and Common Reed Grass *Phragmites communis*. Some of these birds were carrying nesting material in their bills. On 7 June 2005, we saw two adult Cattle Egrets flying from north-west of the Stalwart grid road to land in the same reeds. On 9 June 2005, PST observed five adults in the same area, and two flew from the reeds with strong, purposeful flight to the north-west, presumably to forage. This area of reeds interspersed with shallow open water was also used by Eared Grebes,

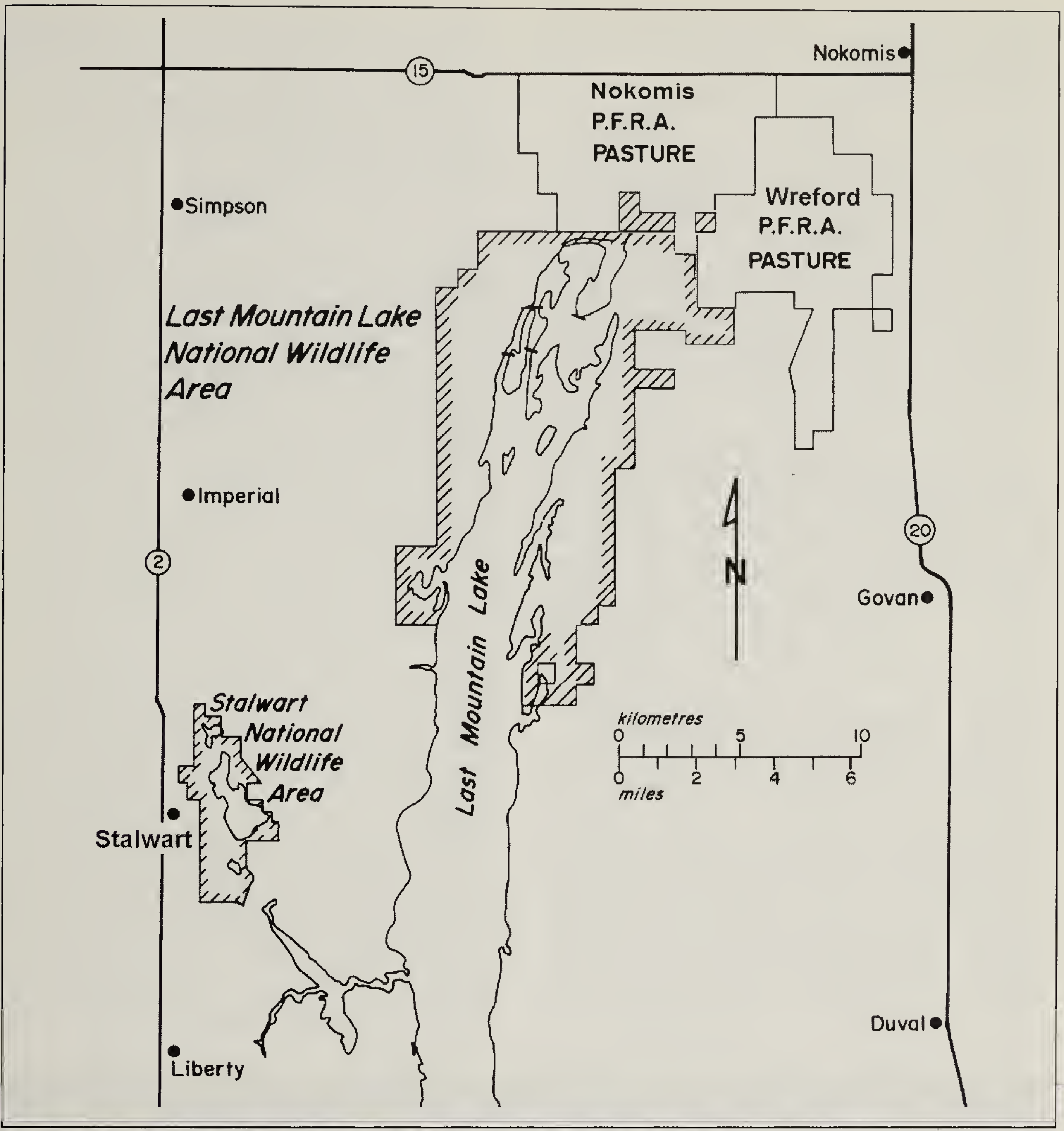

Figure 1. Stalwart NWA and Last Mountain Lake NWA.

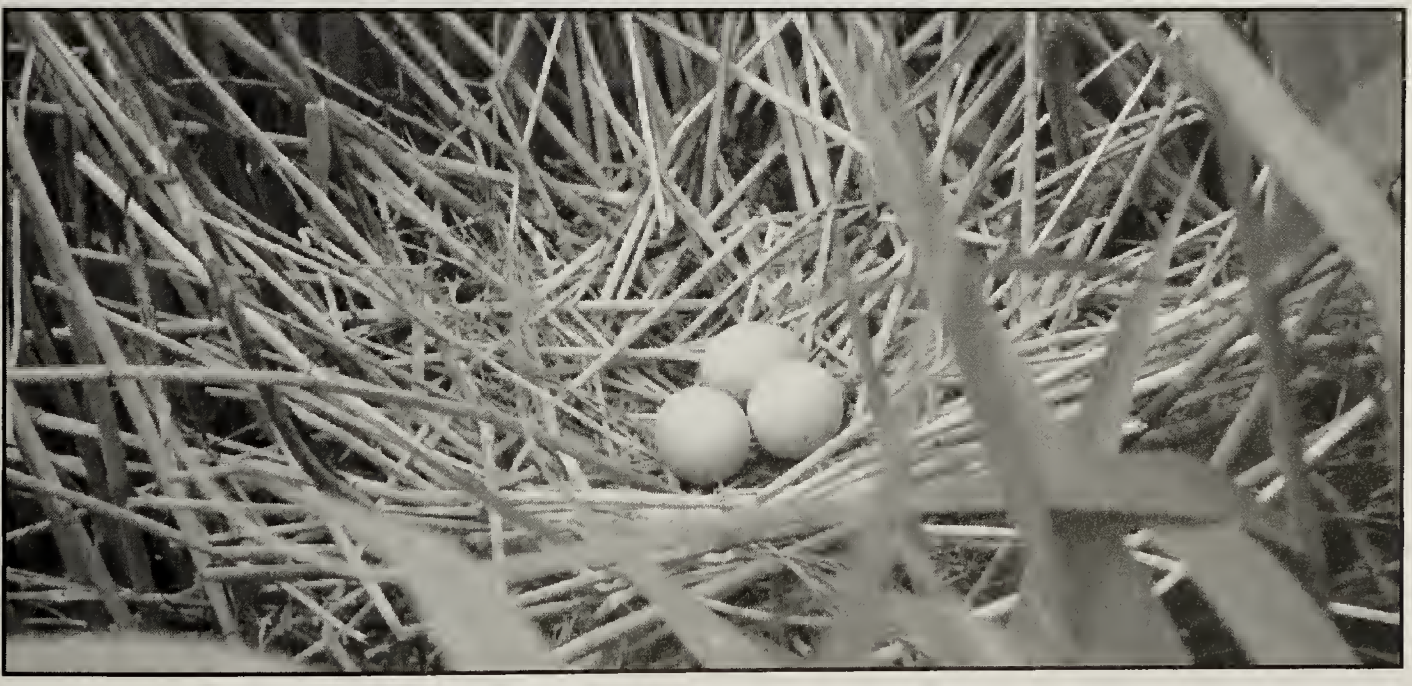

Figure 3. Cattle Egret nest with eggs

Kerry Hecker, Environment Canada - Canadian Wildlife Service

Black-crowned Night-Herons and Franklin's Gulls for nesting.

On 11 June 2005, we conducted an aerial census of colonial waterbirds in some NWAs and Migratory Bird Sanctuaries in Saskatchewan, including Stalwart NWA. While flying over the Stalwart marsh, we counted a minimum of four potential egret nests and took photographs.

On 16 June, we made a brief survey of the Franklin's Gull colony by canoe to evaluate and enumerate species nesting in the area. At this time, we observed seven Cattle Egrets in the marsh – unmistakably adults in breeding plumage (Figure 2, see inside back cover) - and numerous Black-crowned Night-Herons. We found a number of nests in the marsh. Of particular interest were those constructed of both dead and live reeds, plucked and woven into standing dead and green reeds. The nests were elevated approximately 40 cm above the surface of the water, and were up to 20 cm deep, with a firm rounded cup containing between two and four eggs. (Figure 3) This description is consistent with that of Black-crowned Night-Heron nests,[3] and similar to Cattle Egret nests.[5, 10]

While visiting the nests, we could distinguish two distinct types of eggs in nests, although the nest structures were all similar. We used these observed differences in eggs to decide which nests belonged to which species. One type of egg, surmised to be a Cattle Egret egg, was approximately 4 cm long by 3 cm wide, distinctly elliptical, and pale blue. (Figure 4) The other, surmised to belong to Black-crowned Night-Herons, was a bit larger, 4.5 cm long by 3 cm wide, pointed at one end and a slightly darker blue. These were verified later using descriptions in Davis, Harrison and Telfair.[3, 5, 10] During our visit, which we kept as brief as possible, we found three Cattle Egret nests with four, four, and three eggs, and five Black-crowned Night-Heron nests, each with four eggs. Not wishing to disturb the birds further, we then continued our gull

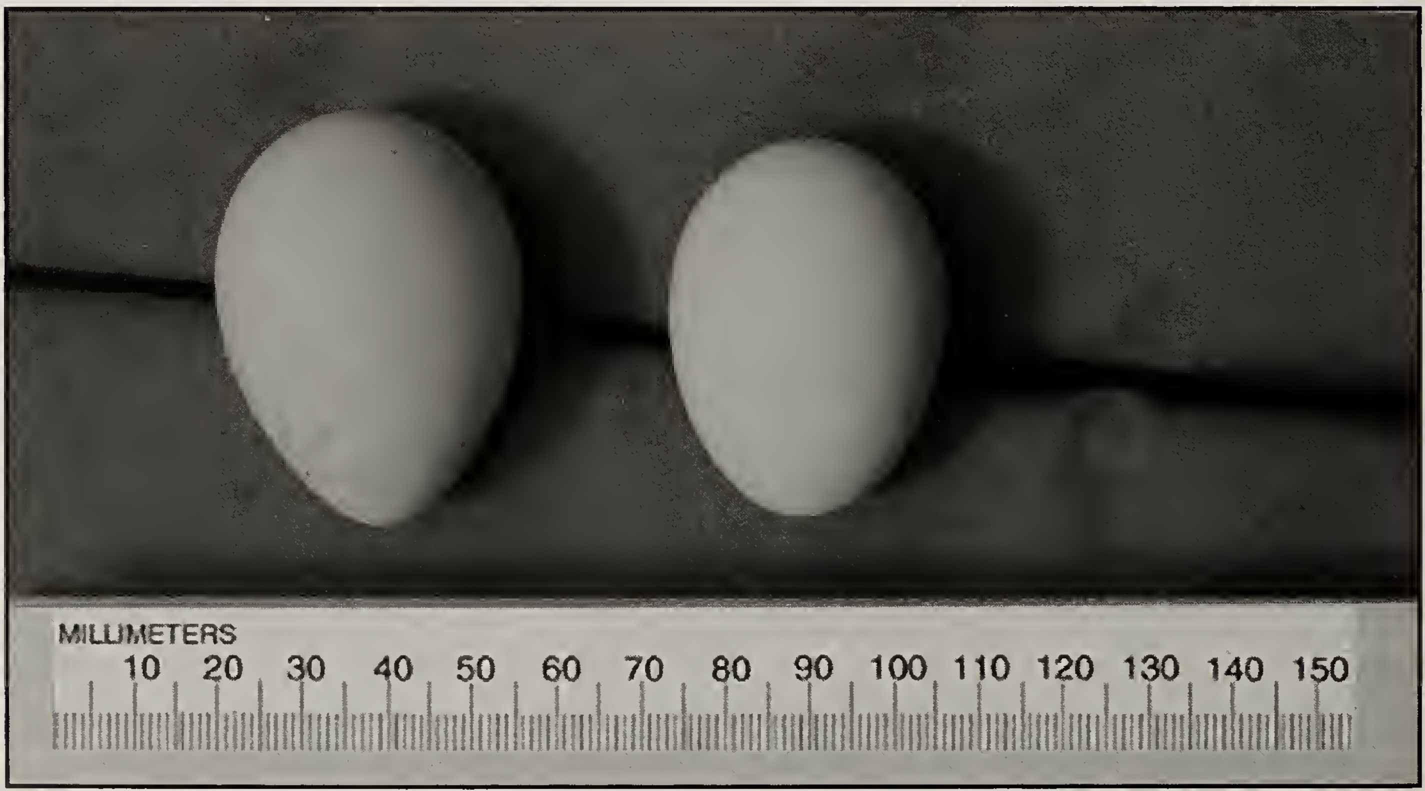

Figure 4. Comparison of smaller, more rounded and lighter blue Cattle Egret egg (right), and larger, more pointed, and darker blue Black-crowned Night-Heron egg (left). Kerry Hecker, Environment Canada - Canadian Wildlife Service

survey and left the marsh shortly thereafter.

We do not believe that we found all the egret and night-heron nests present in the colony during our brief visits by aircraft and canoe. In the canoe, we only visited the periphery of the colony and did not search deeper into the reed bed or in several sites where adult egrets were seen from the air. Observations of adult egrets flying to and from the nesting area suggest there may have been as many as seven or eight pairs in total. The number of night-heron nests in this colony was estimated to be between 25 and 40 pairs.

We, along with Al Smith and Ross Dickson (RDD), continued to record egret sightings through autumn. The sightings of both adult and young-of-year birds in the Stalwart area were plentiful until the end of September, and the last sighting was on 18 October 2005.[4] On 9 December 2005, the authors went to Stalwart NWA to count old nest structures in the colony. While the specific reed and grass beds containing the nests were found, no nest platforms or other evidence of the bird colony were present.

2006

High water levels and a large local muskrat population in the fall and winter of 2005-2006 resulted in the dying back of a number of the bulrush and Common Reed Grass beds at Stalwart NWA in 2006, including those supporting the Franklin's Gull, Cattle Egret and Black-crowned Night-Heron colonies. Eared Grebes and Franklin's Gulls initially returned to these areas but did not stay to nest in any numbers.

On 17 May, between 1600h-1640h, PST saw seven Cattle Egrets in breeding plumage perched in one of the remaining bulrush stands at the 2005 Stalwart NWA breeding colony. One pair copulated. During this time, five additional egrets in breeding plumage flew south-west over the marsh nearby but did not land. On 31 May, PST saw no egrets in the bulrush stand, but observed at least two egrets in a dense stand of Common Reed Grass 100 m west of the old colony site. Black-crowned Night-Herons established a small colony (<25 pairs) in this reed grass stand in 2006. On June 12, PST saw a single egret in a different reed grass stand south-east of the 2005 colony site. There were no further egret sightings and no indication of successful breeding at Stalwart NWA in 2006.

Cattle Egrets were locally common at LMLNWA in 2006, approximately 14 km north-east of Stalwart NWA. As described in Dickson et al 2007[4], the Cattle Egrets at LMLNWA showed behaviour indicative of nesting at a specific site in June and July 2006; during August and September, a flock of Cattle Egrets foraged with a cattle herd near Highway 15 north of the NWA headquarters. The last sighting was 19 October 2006.

2007

The first Cattle Egret sighting in 2007 was of a single bird on 29 April, 5 km west of Last Mountain Lake NWA Headquarters by RDD. Visits to the 2005 and 2006 breeding colony locations found no evidence of nesting egrets; these visits occurred on 18 May 2007 by Beyersbergen,[2] and on 1, 15 and 31 May, and 11, 18 and 29 June 2007 by one or both of the authors. The water levels at Stalwart NWA in spring 2007 were within the normal variation for the spring runoff period. On 11 July 2007, a mixed colony of Cattle Egrets and Black-crowned Night-Herons was discovered by PST 15 km north of LML

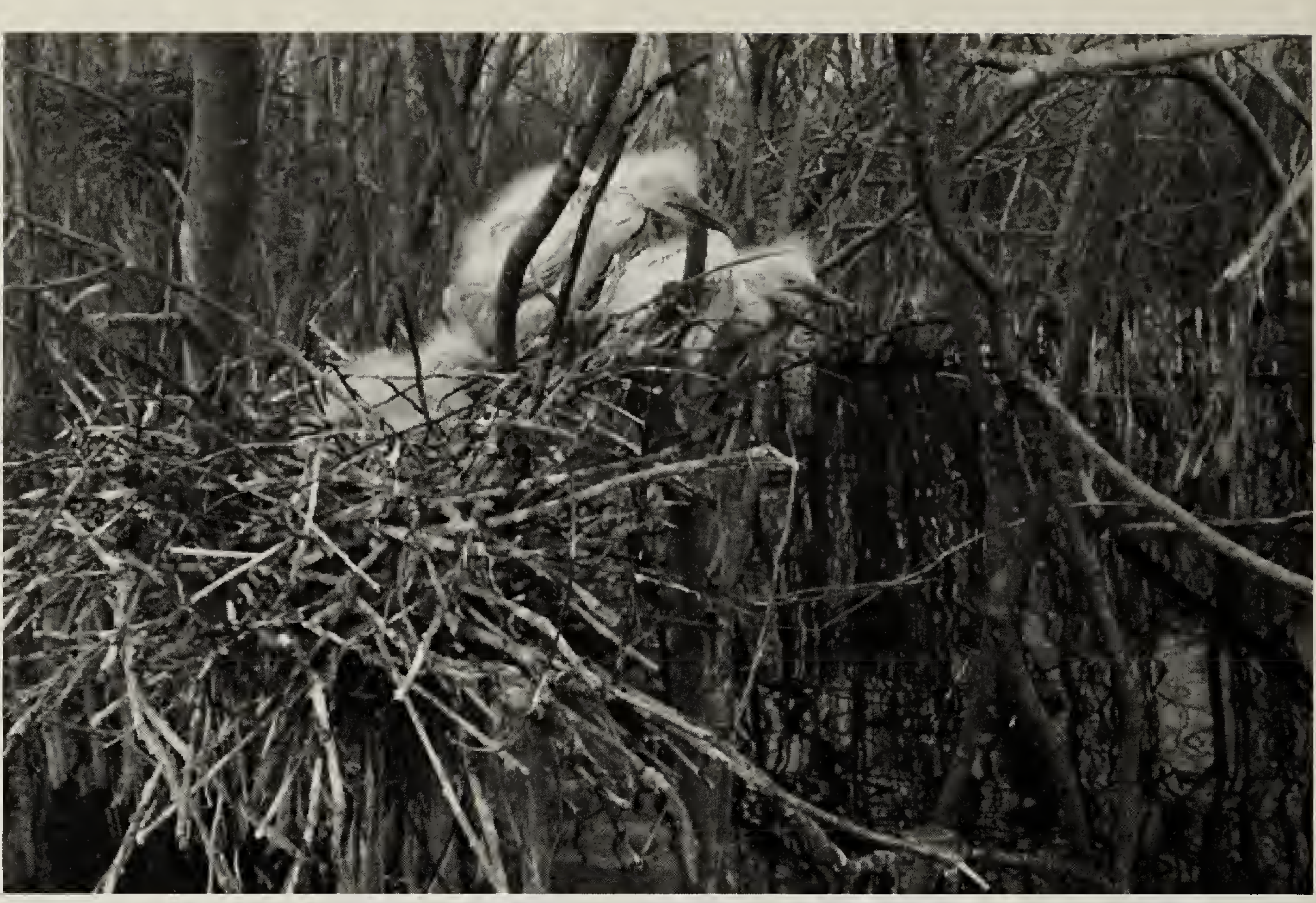

Figure 5. Three Cattle Egret chicks on a stick nest in flooded willows on 14 August 2007. *Joseph Kotlar, Environment Canada*

NWA and documented with photographs. Unlike the previous two years, this egret and night-heron colony was established in flooded willows (*Salix* spp.) 3-5 m tall, bordering an open wetland. Nest structures were built of sticks among the willow branches, often more than one nest to a one willow and some only 1 m above the water surface. Some unoccupied nest structures were in disrepair and could have been built in a previous year. Stains on the willow trunks indicated that water levels had been at least 25 cm higher in the recent past, very likely including the record high spring flood event of 2006. RDD and Joseph Kotlar visited this colony on 14 August to determine success of the breeding effort and noted that all 10 active egret nests that they located were 1.25-3 m above the water surface in August (Figure 5). This position appeared to allow adults to land on the platform or on nearby branches and to leave quickly.

These nests were quite different in materials, structure and height than the nests found at Stalwart NWA in 2005, however they were more typical of nests described for this species.[10] This nesting habitat is similar to our first recorded sightings of Cattle Egrets that seemed indicative of breeding behaviour, which were made in the high-water years of the mid- 1990s.[4] On 26 July 1996, PST and M. Tataryn observed several adult Cattle Egrets perched in and flying around a live willow stand 3-4 m tall, surrounded by nesting American White Pelicans and Double-crested Cormorants on an island in Last Mountain Lake Migratory Bird Sanctuary.[9]

During the 14 August 2007 visit, RDD counted 16 egrets capable of flight – some are assumed to be fledglings - plus one large chick that stayed at the top of a willow. In addition, he found seven active nest platforms; three with downy chicks crouching in the bowl, and the rest with feathered chicks standing on them or clinging to branches near them. A rapid count indicated these broods were 2, 3, 3, 4, 4, 4 and 5 chicks. One of the 3-chick nests also contained an egg. On 15 September, only a single large chick capable of flight remained at the colony location. No adults were seen. All observations thereafter in 2007 were of adults and immature egrets feeding with cattle near Highway 15. Throughout the summer these small white egrets were seen regularly foraging with cattle herds along Highway 15, north of Last Mountain Lake National Wildlife Area. Four fledglings and one adult seen on 1 October were the last Cattle Egrets recorded in 2007.

These results suggest that two nesting efforts were made by Cattle Egrets at this colony in 2007, from either a later influx of breeders to the colony or a renesting effort following earlier losses. Whether such later nesting is typical of this species in our area is not known. Possibly, this was a renesting attempt from birds that had been unsuccessful here or elsewhere. For example, Middle Quill Lake is only 85 km away, and on 13 July 2007 six nests with recently abandoned Cattle Egret eggs were discovered; the adults were not located on that visit or a subsequent visit on 17 July 2007 by Beyersbergen.[2]

Cattle Egrets may have been breeding in the area for more years than those we have documented. Our observations indicate adult egrets are surprisingly restricted in their movements during the breeding season. They can show a strong fidelity to foraging with one or two herds of cattle, within 2 to 6 km of the nesting colony, often taking direct flights between the two locations. Pure white egrets in flight can be difficult to see depending on the sky and light conditions so may be missed even by careful observers. Egrets are most visible when feeding with cattle, often perching on the backs of standing or resting animals. Other cattle herds pasturing closer to the colony seemed not to be visited regularly if at all. Unless egret nesting or feeding sites are in areas frequently visited by observers, they can be missed.

Notably, the same year Cattle Egrets bred successfully at Stalwart NWA was the first documented breeding for the species in Manitoba.[1] Cattle Egrets appear to be settling in as regular breeders in and around Last Mountain Lake National Wildlife Area. It will be interesting to observe whether they persist through wet and dry years, and how they adjust their colony location in the process. The Cattle Egret's affinity for nesting with other colonial species, particularly Black-crowned Night-Herons in our area, suggests they have opportunities to expand their nesting in prairie Canada.

Acknowledgements

We would like to thank the Canadian Wildlife Service staff and birdwatchers who reported sightings, behaviour, dates, and numbers. These include (in alphabetical order) Ross Dickson, Dave Duncan, Joseph Kotlar, Dan Neiman, Dan Sawatzky, Al Smith, Lowell Strauss, Cindy Swoboda, Mark Tataryn and Rob Wapple. Thanks also to Ron Bazin, Ross Dickson, and Al Smith for providing helpful comments on the initial draft of this paper.

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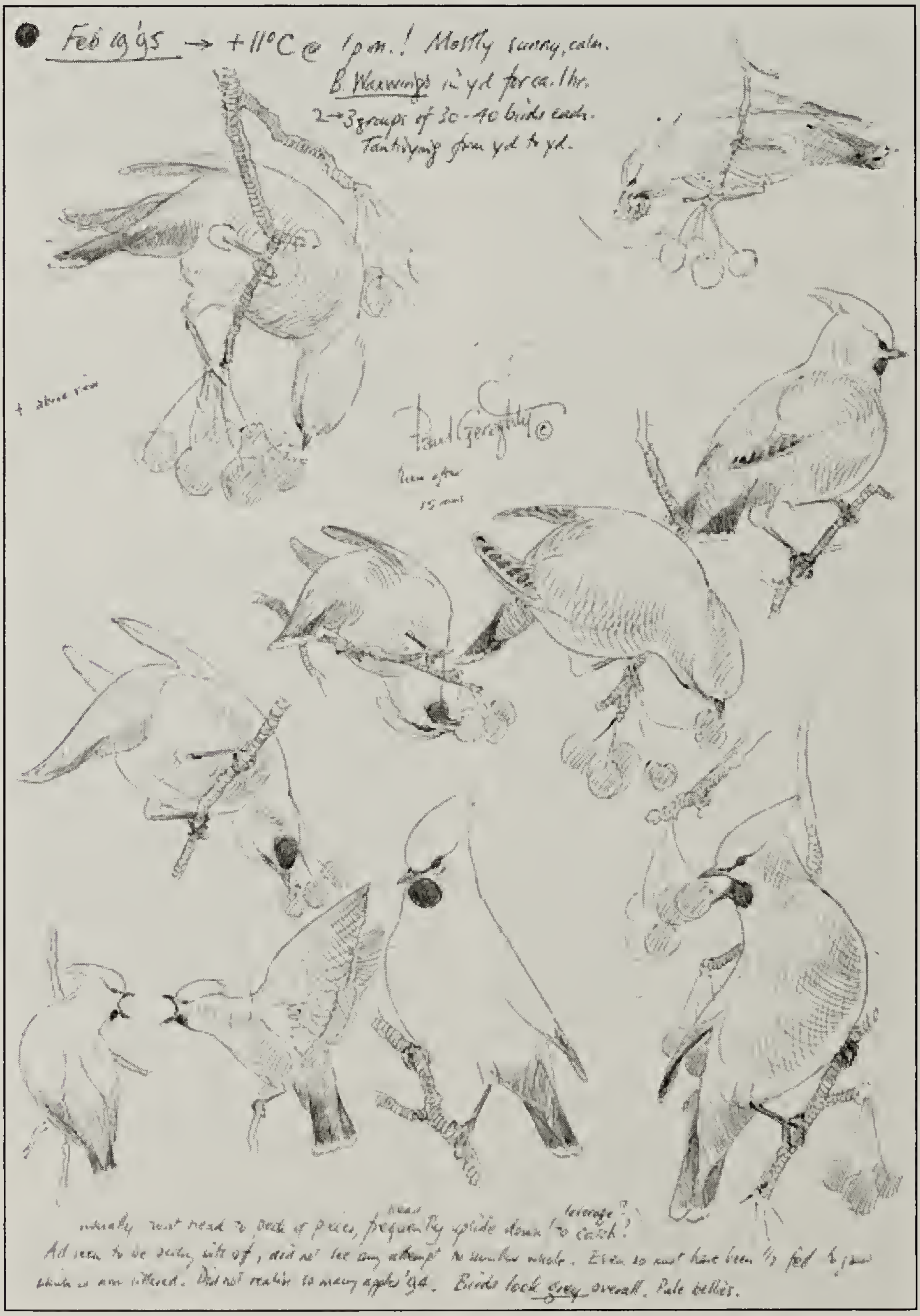

Feb 19 '95 → +11°C @ 1 pm.! Mostly sunny, calm.
B. Waxwings in yd for ca. 1 hr.
2→3 groups of 30-40 birds each.
Tantalizing from yd to yd.

usually must head to peck off pieces, frequently upside down to catch? (leverage?)
All seen to be eating bits of, did not see any attempt to swallow whole. Even so must have been [illegible] full & [illegible] as [illegible]. Did not realize so many apples '94. Birds look grey overall. Pale bellies.

AN EXTRAORDINARY RAVEN NEST

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While entering Whiteshell Provincial Park along Manitoba Provincial Road 307 east of Seven Sisters Falls on 29 April 2008, I noticed an unusual structure in a mature Aspen Poplar (*Populus tremuloides*) about 50 m south of the road, just inside the park boundary. A quick look through binoculars revealed a Common Raven's head showing above a 2-metre-deep column of sticks (Figure 1). The raven soon flushed, leaving no doubt about its identity. The extraordinary structure seemed to consist of at least four distinct nest-like masses piled on top of one another. A similar but smaller structure nearby was about 1 metre deep (Figure 2).

I had noticed ravens nesting at this spot in previous years, but had not seen anything unusual about the nests. The small grove of poplars is adjacent to Big Creek, a marshy backwater of the Winnipeg River, and is surrounded by mostly coniferous forest, much of which was clear-cut in winter 2007-2008. Part of this cutting was a timber salvage operation following a severe windstorm on the night of 23-24 June 2007.[1]

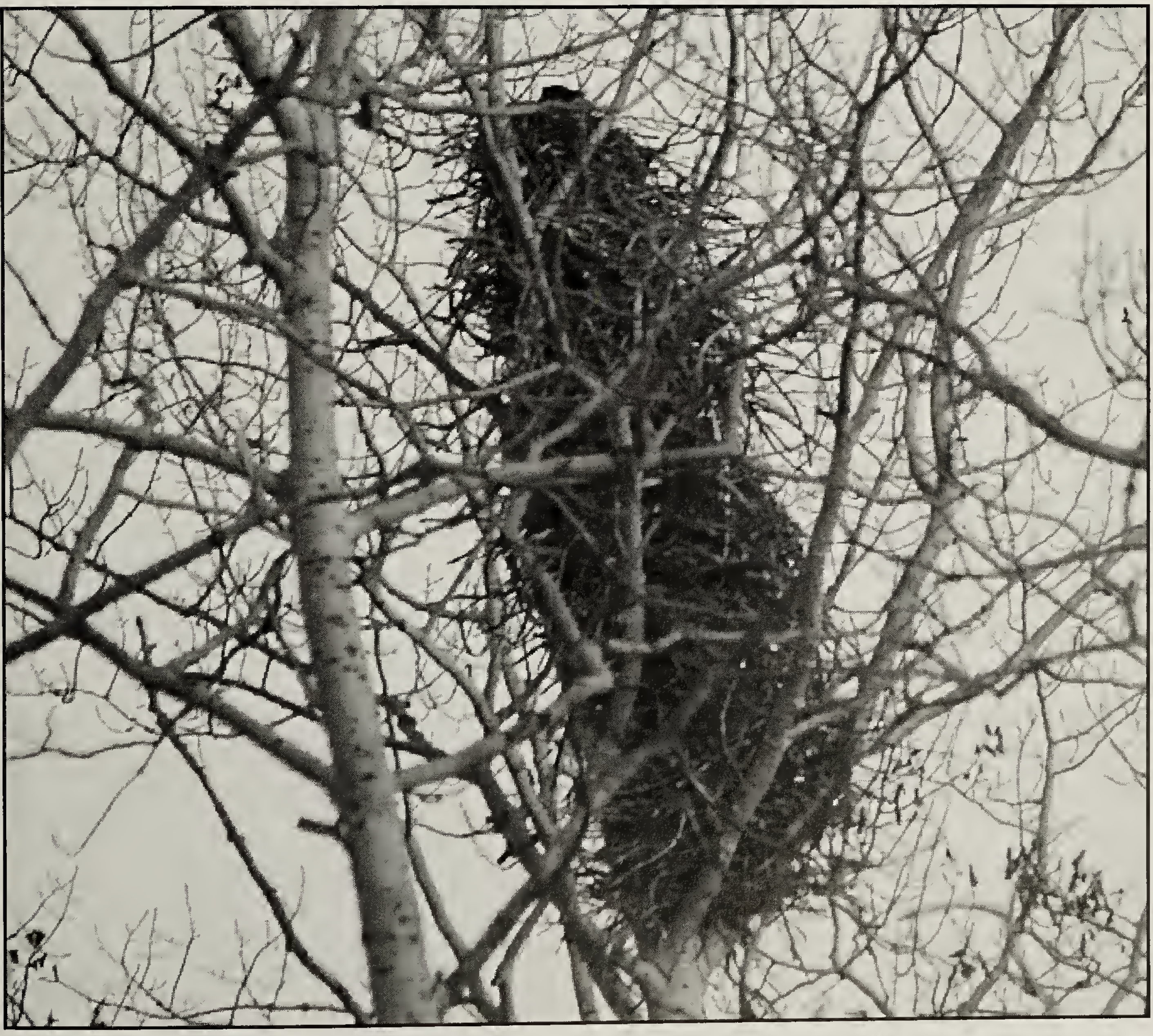

Figure 1. Common Raven nest east of Seven Sisters Falls, MB, 29 April 2008; a sitting adult's head is just visible. *P. Taylor*

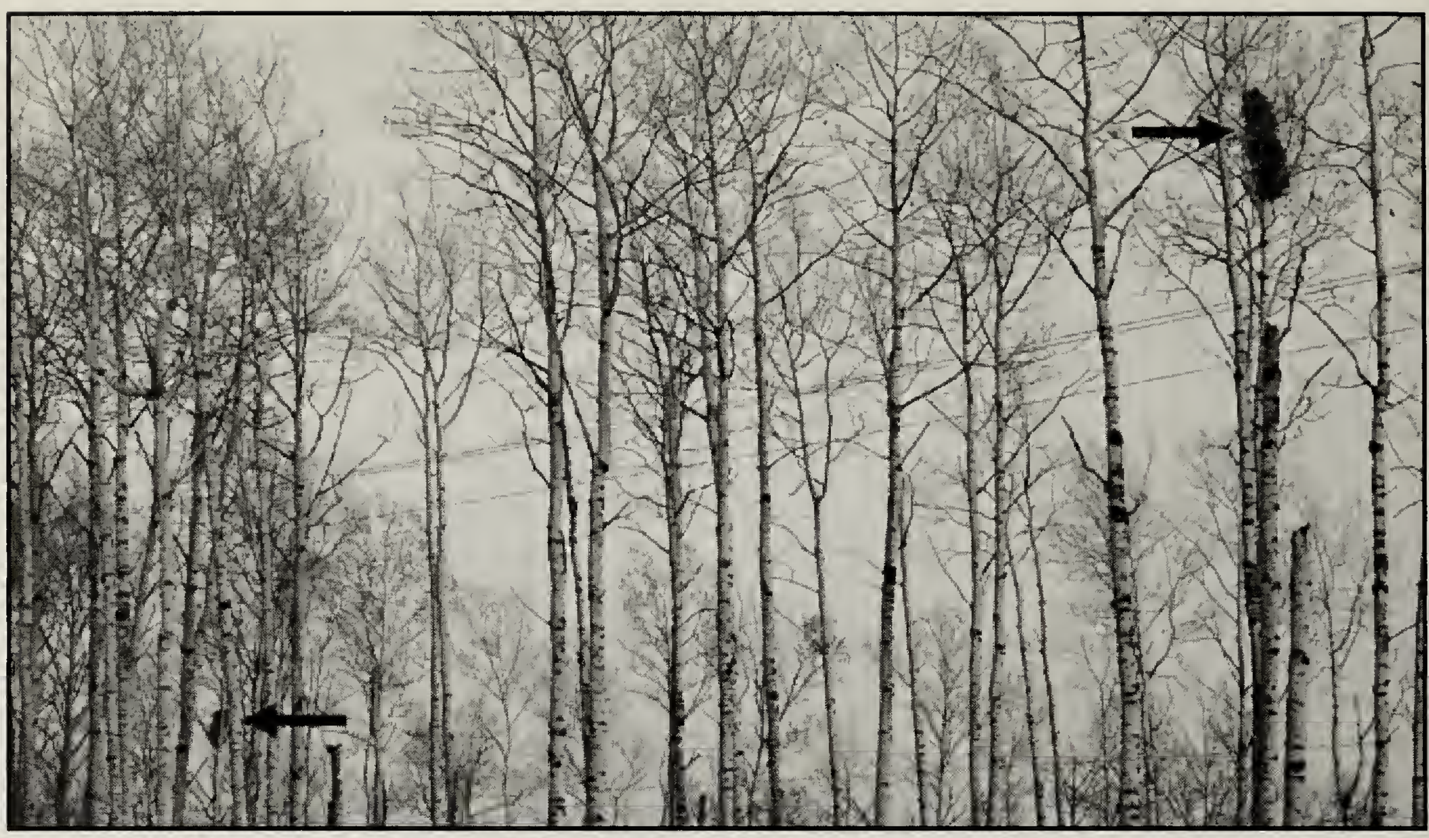

Figure 2 Wide-angle view of the Aspen Poplar stand, with arrows indicating both unusual nests. *P. Taylor*

The nest was observed four more times between 3 and 16 May. On 3 May, it was unoccupied, but a raven was soaring nearby. On 4 May, one bird was sitting on the nest with its presumed mate perched nearby. On 6 May, Rudolf Koes visited the nest; it was unoccupied but a raven was carrying nesting material in the vicinity! On 16 May, Sharon Taylor and I saw one bird sitting on the nest at the end of a windy day with gusts over 40 km/h. I did not visit again until 26 May, by which time the nest had collapsed, leaving only a shallow remnant. Strong winds on 17 and 21 May, and/or winds and a heavy rainstorm on 25 May, had evidently proved too much for this ambitious structure. I found a mass of sticks under the tree, but no sign of nest lining or contents, which may well have been destroyed. The nest had leaned about 15° off vertical, following the upper trunk, with limited lateral support from branches, so its destruction was disappointing but not surprising.

The structure of the nest suggested it was the product of several years of rebuilding and refurbishing, but there is good reason to believe that most of it was built in spring 2008. I pass the area several times per year on birding outings, often between late fall and early spring, and had not noticed the nest before. Nor had Rudolf Koes, who covers the area annually as part of the Pinawa-Lac du Bonnet Christmas Bird Count. Furthermore, it is highly unlikely that such a structure would have survived the violent windstorm of 23-24 June 2007, which felled or damaged trees in about 244 square kilometres of Whiteshell Provincial Forest and Provincial Park.[1] The nest site is at the western extremity of the storm-affected area.

One can only speculate as to what prompted the ravens to build such a structure, and what were the possible roles of disease, injury, abnormal breeding condition, disturbance, or other factors. The birds seem to have become locked into the process of nest construction, and had not progressed to nest-lining and egg-laying in the normal sequence. Usually ravens in the Whiteshell region can be seen in aerial courtship flights in February, and nest construction or refurbishment gets underway around mid-March (my earliest such record is 4 March). Noisy, well-feathered young are typically visible in nests by the second half of May, with fledging as early as 25 May. Other raven nests in the area in 2008 appeared to follow this normal schedule, despite the cool, slow spring. The unusual nest appeared to be well behind schedule at best—not surprising, given the extra construction effort!

I have found no references to similar raven nests. According to Boarman and Heinrich,[2] the female Common Raven apparently does most of the construction, with the male assisting by bringing sticks to the nest or performing some of the construction. Tree nests typically consist of a base of large sticks and other available materials (such as bones and wire), wedged into a crotch and woven into a rough basket. An inner cup is woven from smaller branches and twigs. The bottom of the cup is sometimes lined with mud, wool, fur, shredded bark, grasses, or other soft materials.[2] Raven nests are often asymmetrical, and range in shape from 40–153 cm diameter, 20–61 cm high, with the interior cup 22–30 cm diameter and 13–15 cm deep.[2] Nests are frequently reused or rebuilt.

Ravens often build their nests on electricity transmission towers and similar steel structures, even in forested areas. They are a particularly common sight on transmission towers in the Grand Rapids region of west-central Manitoba. On 23 June 2008, I noticed several such nests (empty by then) along Highway 60 in the Easterville area southwest of Grand Rapids. Among these were some unwieldy double- and triple-decker structures bearing some resemblance to the Whiteshell nest, but not nearly so high (Figure 3). The particular design of the towers on this transmission line seemed to offer good lateral support for these nests.

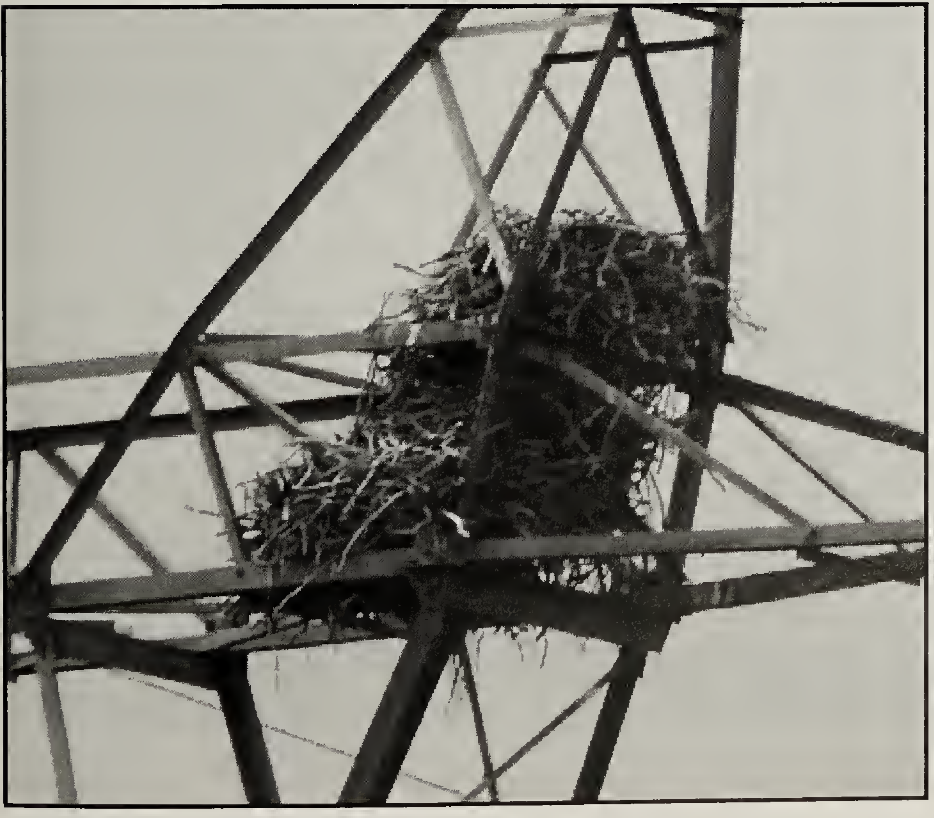

Figure 3 Empty Common Raven nest along Hwy 60 southwest of Easterville, MB, 23 June 2008.
P. Taylor

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RAPTORS NESTING IN WASCANA PARK, REGINA

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Over 25 different species of raptors have been documented nesting within urban centres across the globe.[6] In an urban setting, raptors benefit from concentrated food supplies, "good" potential nesting sites, and shelter from predators.[6] However, they also face novel challenges such as increased exposure to collisions with vehicles and buildings, pigeon poisoning, and disturbances such as building and city maintenance.[6] As a result of these challenges, some urban-nesting raptors have lower fledging success compared to their rural counterparts.[1,2]

In Saskatchewan, at least six raptor species have previously been documented as nesting within urban centres. These include, in addition to the ones reported here, Long-eared Owl, (see photograph by Morag Granger on page 177 in September 2008 *Blue Jay*) and Peregrine Falcon.[3,4,5,7] During the 2008 breeding season, I documented nesting by Cooper's Hawks, Great Horned Owls, American Kestrels and Merlins in Wascana Park within Regina. Here I present the outcome of these nests and compare the fledging success between these urban nests to rural nests I located during the same breeding season.

Cooper's Hawk (Figure 1)

This is the fifth year that Cooper's Hawks have been found nesting in Wascana Park since 2003. In 2006, I banded both adults with red-alphanumeric bands. On 7 May 2008, Joseph Kotlar and I observed the same pair building a nest 14.3 m above the ground in an American Elm near the Royal Saskatchewan Museum. On 23 May, an adult was observed in an incubating position.

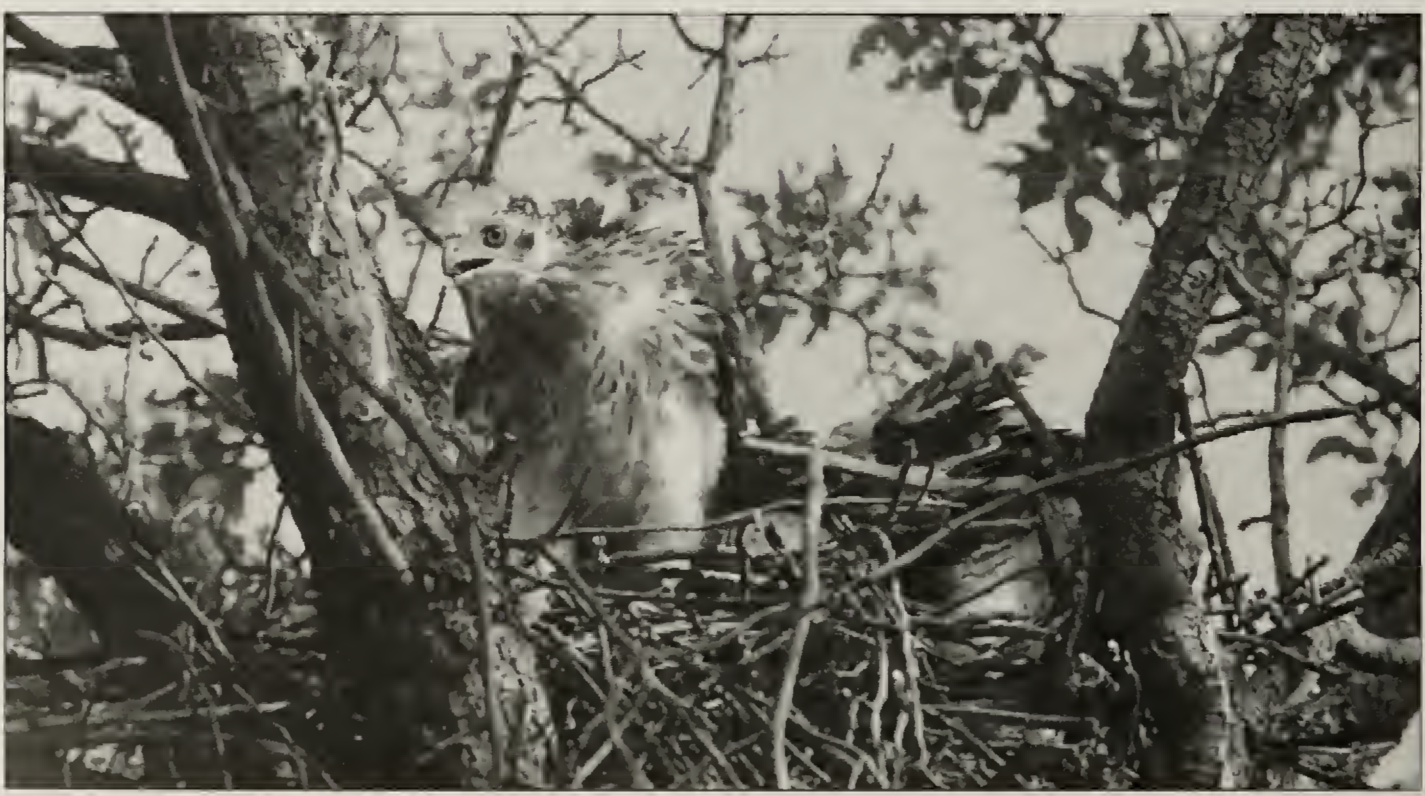

Figure 1. Cooper's Hawk chicks in nest in Wascana Park, Regina. *J. Clarke*

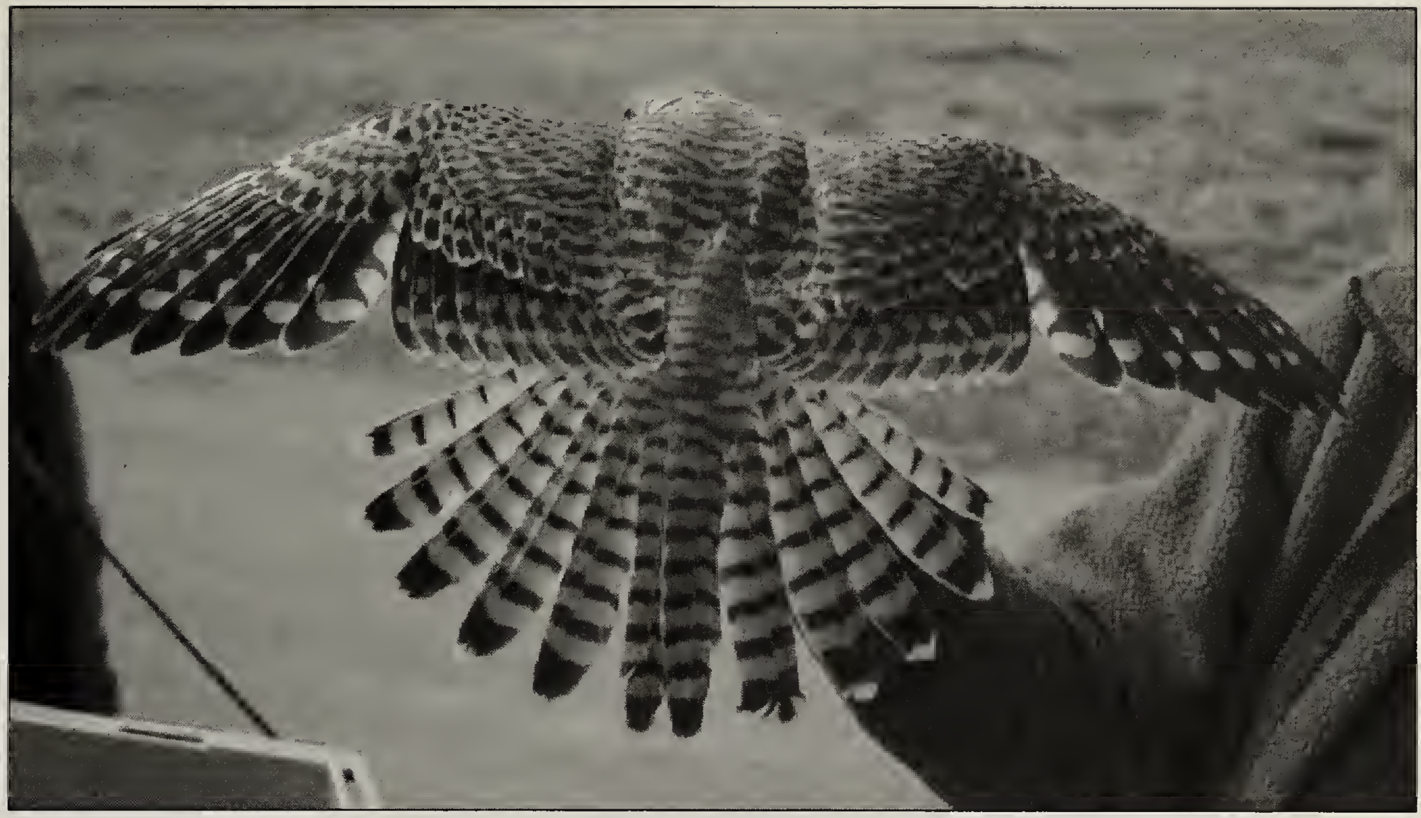

Figure 2. Adult female American Kestrel banded at nest box #25. *J. Clarke*

On 14 July, three chicks about 23 days old were present in the nest: two females and one male, which were banded. By 31 July, all three chicks had fledged and were within 100 m of the nest. All three chicks were still present in the area of the nest as of 12 August. On 21 August only one chick was still near the nest. The rural nests I visited this year had comparable clutches of young (3.5 chicks fledged/ nest, n=2).

Great Horned Owl

On 26 April 2008, a Great Horned Owl nest was found in Wascana Park, about 5 m from the edge of Albert Street, 12.1 m from the ground in a spruce tree. Only one other nesting attempt by this species has been noted in the park (Bob Ewart and Lorne Scott, *pers comm.*). Joseph Kotlar and I banded the single nestling on 7 May. I did not continue intensively monitoring the nest but received a report that a fledgling Great Horned Owl was observed flying near the nest after I noticed the nest was empty. With the nest so close to Albert St. I was worried that the chick would be unintentionally startled into traffic and struck by a vehicle. However, there was no recovery of its band nor any sign of a dead owl on Albert Street during the summer. This nest had low productivity compared to rural sites (2.01 chicks/nest at the time of visit, n=72).

American Kestrel (Figure 2)

Two of three nest boxes designed for American Kestrels in Wascana Centre were occupied by kestrels in 2008. Nest box #25 sits on an old telephone pole near the entrance to the Wascana Country Club, near the old Plains Hospital. (While this area is not typically associated with Wascana Park, it is owned by the Wascana Centre Authority and is therefore part of the park.) On 23 April 2008, an adult female kestrel was captured and banded at this nest, while she incubated five eggs. Five chicks, three females and two males, were banded on 9 June and fledged ten days later.

Nest box #31, also on a telephone pole, was situated at the Wascana

Adult female Cooper's Hawk banded 15 July 2006, at Roche Percee
J. Clarke

Centre Authority greenhouse, south of Douglas Park. I was unable to check the box until after the chicks had hatched. This nest was possibly a renesting attempt as it was quite late. On 18 June the chicks were only one week old, compared to the chicks in Nest box #25 that were fledging at this time. On 8 July, four female nestlings were banded a few days before fledging. These two urban nests fledged slightly more chicks than their rural counterparts (3.8 chicks fledged /nest, n=5).

Merlin

There were two nesting attempts made by this species although the outcomes were not determined. One pair was present at a nest site that was also used in 2007 behind the Legislative building, and gave alarm calls as I approached the nest late in June when chicks should have been present. The second nest was in the large spruce trees in the parking lot of the T. C. Douglas building on Albert St and 23rd Avenue. The outcome of this nest also was not determined.

Acknowledgements

Thanks to all who helped locate and monitor these nests, as well as those who assisted while banding.

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SPRING 2008 - A DEVASTATING TIME FOR MOUNTAIN BLUEBIRDS ON THE PRAIRIES

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The 2008 bluebird season started out as a normal year. The bird houses were clean, the fronts were all in place and the weather was balmy. Hundreds of Mountain Bluebirds returned to their natal area to establish nesting territories. Normally they return to this district around Provost, Alberta between March 5th and 10th. This year was no exception. Shirt sleeve weather by April 16th had encouraged mated pairs to chose nest boxes and proceed with nest building. Egg laying would not start for about two weeks. All seemed to be proceeding normally.

But then, snow arrived! Not just a few flakes for a short period of time, but about 30 cm accompanied by strong winds, blizzard conditions and colder than normal temperatures. The intense storm lasted from April 19 to 27 with disastrous effects on many birds and animals. The bluebirds were no exception. Though these hardy birds generally experience one or more snowstorms each spring, the conditions this time were too severe and the duration too long.

Deep snow cover prevented foraging for food; spiders, bugs, even cocoons or larva could not be found. After their long migration from Texas, body reserves were already low. Bluebirds will huddle together (often up to a dozen in one nest box) to keep warm during cold snaps and these did, but they could not cope with the extended low temperatures and strong winds. Many died from hypothermia and starvation. I estimate that the bluebird population on the Johnson Bluebird Trail was reduced close to the numbers when we first started our hobby in 1970 (seven pair that first year.)

On April 27th I ventured out on a prime part of my trail and saw no live bluebirds only one dead bird that had huddled in a house.

May 20th, after driving close to 14 km on the trail, I found one pair in a tree near a nest box. Could this be the only ones that survived? Normally by this time most birds would be incubating eggs. There was no sign of eggs in the nest box.

As I checked the nest boxes on my 357 house trail over the 2008 summer and fall, many comparisons became evident.

- In 2008 Mountain Bluebirds occupied 5.8% of my houses; normally they occupy around 50%.
- Tree Swallows occupied 76% of my houses in 2008, as compared to 55% normally.

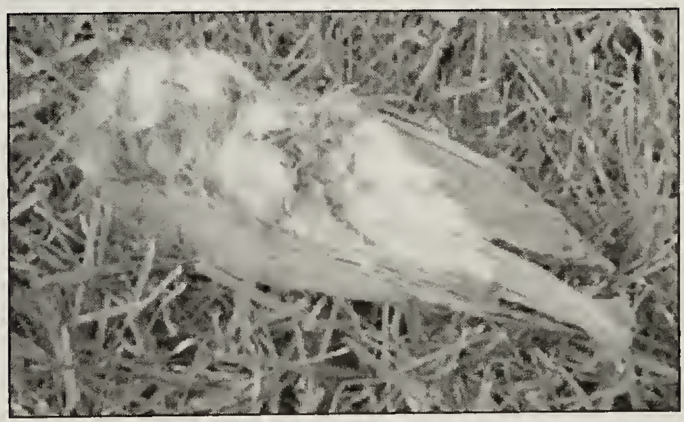

Figure 1. Male Mountain Bluebird missing tarsi and feet. *Lois Johnson*

- House Wren numbers remained fairly constant.
- By June 6th, on a normal year, I can band hundreds of bluebird nestlings; this year my trail had no young birds ready for banding until June 18th.
- The number of bluebirds fledging the nest in 2008 was 76 as compared to about 600-700 on a normal year.

Other observations from 2008 bring forth more questions than answers.

Thirteen adult male bluebirds as compared to one adult female were found dead in nest boxes as a result of the severe weather. Do females return from migration with more body fat and are better equipped to survive the severe weather? Did the males not allow females in the birds houses when "the chips were down"? Did the females leave the area for a more favourable climate? (It seems most of Alberta was held in the grips of the storm.)

Of the 13 dead males found in nest boxes, nine had no feet or tarsi on their body (Figure 1). At first I suspected cannibalism as three birds were in a single box. Then a single bird in another box had met the same fate. Had the feet and legs frozen and fallen off? I shudder to think of the pain and struggling the birds endured while attempting to climb into the box using only the leg stumps.

During the nesting season, very few males were observed near the nest boxes. Did one or both parents travel several kilometres to find a mate? I suspect there were many "single mom" families. One group of healthy banded youngsters died in the nest when their mother (and sole food source) failed to return.

The greatest number of successful nests on my trail was near where a fire occurred around May 20th. This brush fire was after the April storm date. Did the bluebirds congregate there during or following the storm? Heat from the fire might bring out insects for the starving birds making it a choice place to stay and raise the young. Fourteen young birds fledged successfully along this 1.5 kilometre of trail.

And finally, how long will it take the bluebirds to return to their previous numbers?

Mountain Bluebird *George Tosh*

PLANTS

THE SALTBUSHES *(Atriplex)* OF THE PRAIRIE PROVINCES

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Nuttall's Saltbush (Atiplex gardneri var. gardneri, A. nuttallii) *Jim Romo*

Introduction

The saltbushes (*Atriplex*) comprise a genus of plants with several uncommon morphological and physiological characters. The common name "saltbush" refers to the fact that most of the species in this genus are tolerant of saline soils. This is a trait that saltbush species share with several other genera in the goosefoot family (Chenopodiaceae). The saltbushes are a difficult group to identify because of their small flowers and highly variable leaf sizes and shapes. In this article I will: (1) discuss the taxonomy, habitat, distribution, status and economic impact of the saltbush or orache (*Atriplex*) genus, (2) describe the characteristics of *Atriplex* species, and (3) present a taxonomic treatment of the genus consisting of a dichotomous key and descriptions of those species found in the Canadian prairies. All the species described in this article occur in the midwestern United States except for Glabrous Orache (*A. glabriuscula*).

In North America, the saltbush genus includes 62 species occurring mainly in the arid west.[19] In the prairie provinces of Canada, there are 14 species in total, six of which were introduced from Eurasia. The genus recently has been reviewed taxonomically by the Flora of North America committee.[19] This review resulted in taxonomic changes to several common species. The scientific name of Nuttall's Saltbush (*A. nuttallii*) is now considered invalid; the valid scientific name is *A. gardneri*.[19] Two varieties of *A. gardneri* are recognized in western Canada: var.

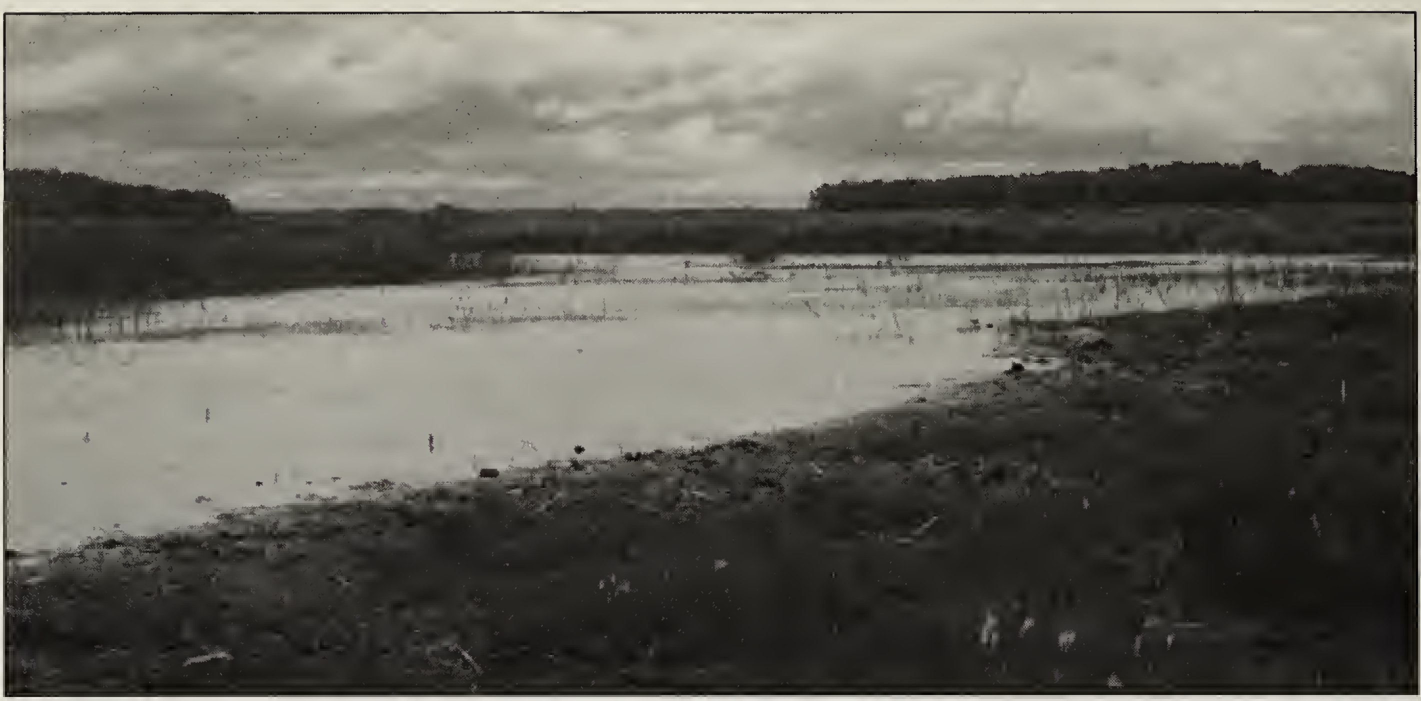

Figure 1. Saline marsh near West Shoal Lake, Manitoba. *D.B. Robson*

gardneri and var. *aptera*, the former commonly called Nuttall's or Gardner's Saltbush, and the latter Nelson's Saltbush. Hastate Orache (*A. prostrata*) was previously considered to be a variety of Spreading Orache (*A. patula*), namely *A. patula* var. *hastata*. Rillscale (*Endolepis suckleyi*) is now included in the saltbush genus under the name Suckley's Orache (*Atriplex suckleyi).*

Three species of exotic saltbushes have arrived in Canada in the last several decades: Two-scale Saltbush (*A. heterosperma*), Oblong-leaf Orache (*A. oblongifolia*) and Tumbling Orache (*A. rosea*) to join the three exotics that have been here for much longer.

In a checklist of Saskatchewan's vascular plants, Harms included an additional species of introduced Eurasian saltbush, namely Russian Orache (*A. aucheri* Moq.).[7] This inclusion is based on two specimens collected by the late George Ledingham in disturbed habitats in southern Saskatchewan in 1997. They may have arrived in Canada as part of an international shipment of goods, as the specimens were found on CPR tracks and near a landfill. Russian Orache was not included in Flora of North America, nor is it listed on the Integrated Taxonomic Information System (ITIS) or the United States Department of Agriculture (USDA) websites. Therefore, I have chosen to exclude this species because it does not appear to have become truly naturalized in North America; in fact it may have simply died out. However, it is worth scrutinizing specimens of Garden Orache, which looks very similar to Russian Orache. The latter has bracteoles that are more oblong and 10 mm or less in diameter, and leaves that are more triangular in shape and slightly smaller (2-8 cm).

Identification of saltbush species can be difficult as the bracteoles (i.e. highly modified leaves at the base of a flower) are generally needed but are not prominent when the plant is very young. Examination of the bracteoles may require a hand lens, as they often are quite small.

Habitat and Distribution

Saltbush species occur mainly in saline, alkaline and disturbed habitats (Figure 1). Saline and alkaline habitats have high concentrations of sodium, calcium, magnesium, carbonates, bicarbonates or sulphates.[10] These conditions are toxic to many plants but halophytes and alkaline-tolerant plants have a number of adaptations that make survival in these habitats possible. Saltbush plants accumulate salt in their cells so that saline water can continue to flow into the roots.[10] However, as salts can be harmful to plant cells, some method of dealing with the salts is needed. Many saltbush species store salts in special hairs, called salt glands or bladders, which are shed periodically to rid the plant of excess salt.[3] The presence of these glands gives the plants their "scurfy" appearance. The succulence of some species (e.g. Suckley's Saltbush) also contributes to salt tolerance because the stored water dilutes salts, making them less harmful.[3, 10]

Saltbush species are most commonly found in the Prairie ecozone and less commonly in the Boreal Plain ecozone.[1] All native saltbush species exhibit at least some tolerance to saline or alkaline conditions and are typically restricted to these habitats within the two ecozones. The exception is Glabrous Orache, which is found only in northern Manitoba, near Churchill.[8] This species has been reported as occurring in northeastern Alberta but the specimen was immature and difficult to positively confirm. Introduced species are typically found along roadsides, disturbed saline areas, and in cultivated fields.[4, 16] Garden Orache (*A. hortensis*) is the most common introduced saltbush species found in the Prairie and Boreal Plain ecozones.[4, 16]

Status of the Saltbushes in Canada

Of the 14 native species found in the Canadian prairies, five are rare either nationally or only provincially. Two saltbush species considered nationally rare are Four-wing Saltbush (*A. canescens*) and Powell's Saltbush (*A. powellii*).[2] Both of these species occur on saline clay flats in southern Alberta and southwestern Saskatchewan.[2, 9, 12] Wedgescale (*A. truncata*) is considered provincially rare in Alberta and Saskatchewan, and also occurs on saline clay flats.[9, 12] Glabrous Orache (*A. glabriuscula*) is rare in Manitoba, being found only in salt marshes along Hudson Bay.[21] Silvery Saltbush (*A. argentea*) is considered rare in Manitoba but only uncommon in Alberta and Saskatchewan.[21] In addition to growing in relatively uncommon habitats, the apparent rarity of these species may be influenced by their annual habit and the fact that the seeds may not germinate every year.[15]

Six species of saltbush have been introduced from Eurasia. One of these species, Garden Orache, is a common agricultural weed, which is eaten as a potherb in many countries, including China.[18] Garden Orache is the alternate host for a number of viral crop diseases.[16] Spreading Saltbush and Two-scale Saltbush are fairly common weeds in disturbed, saline areas such as ditches.[16] The remaining introduced species, Oblong-leaf Orache, Hastate Orache, and Tumbling Orache, are relatively uncommon weeds moving north from the United States, but they have the potential to become more troublesome, especially if climate warming makes conditions in the prairies more suitable for their growth.[6]

The rarity of some saltbush species and the potential of others to become crop weeds in a changing climate make collection and identification of plants in this genus important. They are typically overlooked and seldom collected due to their lack of large, colourful flowers and their presence in habitats not frequently visited by naturalists (e.g. salt marshes and saline flats). Unusual specimens observed are therefore worth collecting and donating to

Table 1. Comparison table of major physiological and morphological characters of saltbush plants in the Canadian prairies.

Common Name	**Scientific Name**	**Anatomy**	**Sexuality**	**Bracteole Structure**	**Seeds**
Silvery Saltbush	*A. argentea*	Kranz	Monoecious	Not spongy, thick, toothed	Monomorphic
Four-wing Saltbush	*A. canescens*	Kranz	Dioecious or rarely monoecious	Not spongy, thick, winged (4)	Monomorphic
Thickleaf Orache	*A. dioica*	Non-Kranz	Monoecious	Spongy, tuberculate	Dimorphic
Gardner's Saltbush	*A. gardneri*	Kranz	Dioecious or sparingly monoecious	Somewhat spongy, toothed or winged, tuberculate	Monomorphic
Glabrous Orache	*A. glabriuscula*	Non-Kranz	Monoecious	Spongy, thick, ± tuberculate	Dimorphic
Two-scale Saltbush	*A. heterosperma*	Non-Kranz	Monoecious	Not spongy, thin, membranous	Dimorphic
Garden Orache	*A. hortensis*	Non-Kranz	Monoecious	Not spongy, thin, membranous	Dimorphic
Oblong-leaf Orache	*A. oblongifolia*	Non-Kranz	Monoecious	Not spongy, thin, membranous	Dimorphic
Spreading Orache	*A. patula*	Non-Kranz	Monoecious or sparingly dioecious	Not spongy, thin, membranous	Dimorphic
Powell's Saltbush	*A. powellii*	Kranz	Dioecious or sparingly monoecious	Not spongy, thick, tuberculate	Monomorphic
Hastate Orache	*A. prostrata*	Non-Kranz	Monoecious	Thin, ± spongy, ± tuberculate	Dimorphic
Tumbling Orache	*A. rosea*	Kranz	Monoecious	Not spongy, thick, short tuberculate	Dimorphic
Suckley's Orache	*A. suckleya*	Non-Kranz	Monoecious	Not spongy, thin, membranous	Monomorphic
Wedgescale	*A. truncata*	Kranz	Monoecious	Not spongy, ± tuberculate	Monomorphic

herbaria to better determine the distribution and frequency of these species. In general the best time to collect saltbush specimens is from August to October; mature specimens with well-developed bracteoles are the easiest to identify and immature specimens may be unidentifiable even by an expert.

Economic Impact of Saltbushes

Saltbushes are in the goosefoot family, which contains many of the species that we consider to be weeds including Russian Pigweed (*Axyris amaranthoides* L.), Russian-thistle (*Salsola tragus* L.), Lamb's-quarters (*Chenopodium album* L.) and Summer Cypress (*Kochia scoparia* (L.) Schrad.).[16] However, it also contains several highly nutritious species such as Beet and Swiss Chard (*Beta vulgaris* L.), Quinoa (*Chenopodium quinoa* Willd.) and Spinach (*Spinacia oleracea* L.).[18]

The saltbush genus contains several species that have been eaten as "wild spinach." Garden Orache was a popular potherb in southeastern Europe and western Asia.[18] In the past, this species was used in Italy to colour pasta red. Garden Orache seeds can still be purchased from specialty garden seed companies. As salinization of agricultural soils occurs, it may once again become a popular crop plant due to its natural salt tolerance. Other potherbs in this genus include Four-wing Saltbush, Hastate Orache, and Sea Purslane (*A. halimus* L.).[18] Meat from sheep that have grazed on saltbush plants is noted to be particularly high in vitamin E.[14]

Since saltbush plants are wind-pollinated, they may cause rhinitus or hay fever in sensitized people.[4] Saltbush plants typically flower in summer and fall and can produce copious quantities of pollen.

Saltbush Characters

The saltbush genus has a number of unusual characters that are useful in differentiating the species from each other. These characters are summarized in Table 1. Some saltbush species possess a special kind of plant anatomy called "Kranz" anatomy; the leaf veins are dark green and highly curled, unlike regular net, or reticulate-, veined species.[4] To observe Kranz venation the underside of a leaf must be carefully scraped with a sharp blade to remove the surface scales and hairs and examined with a hand lens or microscope. Kranz anatomy enables these plants to use a photosynthetic pathway called C4 that is more efficient than the regular C3 pathway.[3, 10] Kranz anatomy occurs in six species of saltbush found in the Canadian prairies along with a number of plants in other families, most commonly the warm season grasses.[4] Blue Grama (*Bouteloua gracilis* (Willd. *ex* Kunth) Lag. *ex* Griffiths) and cord grasses (*Spartina* spp.) are examples of common C4 grasses.

Saltbushes have separate male (staminate) and female (pistillate) flowers, the former producing pollen in stamens and the latter producing seeds in pistils. The staminate flowers have a small calyx of 3-5 sepals while the pistillate flowers generally lack a calyx (Garden and Suckley's Orache are the exceptions).[4] Some saltbush species produce both staminate and pistillate flowers on the same plant; these plants are called monoecious. Other saltbush species are dioecious with separate staminate and pistillate flowers on different plants. Some species produce plants with most flowers staminate or pistillate but with a few flowers of the opposite sex.

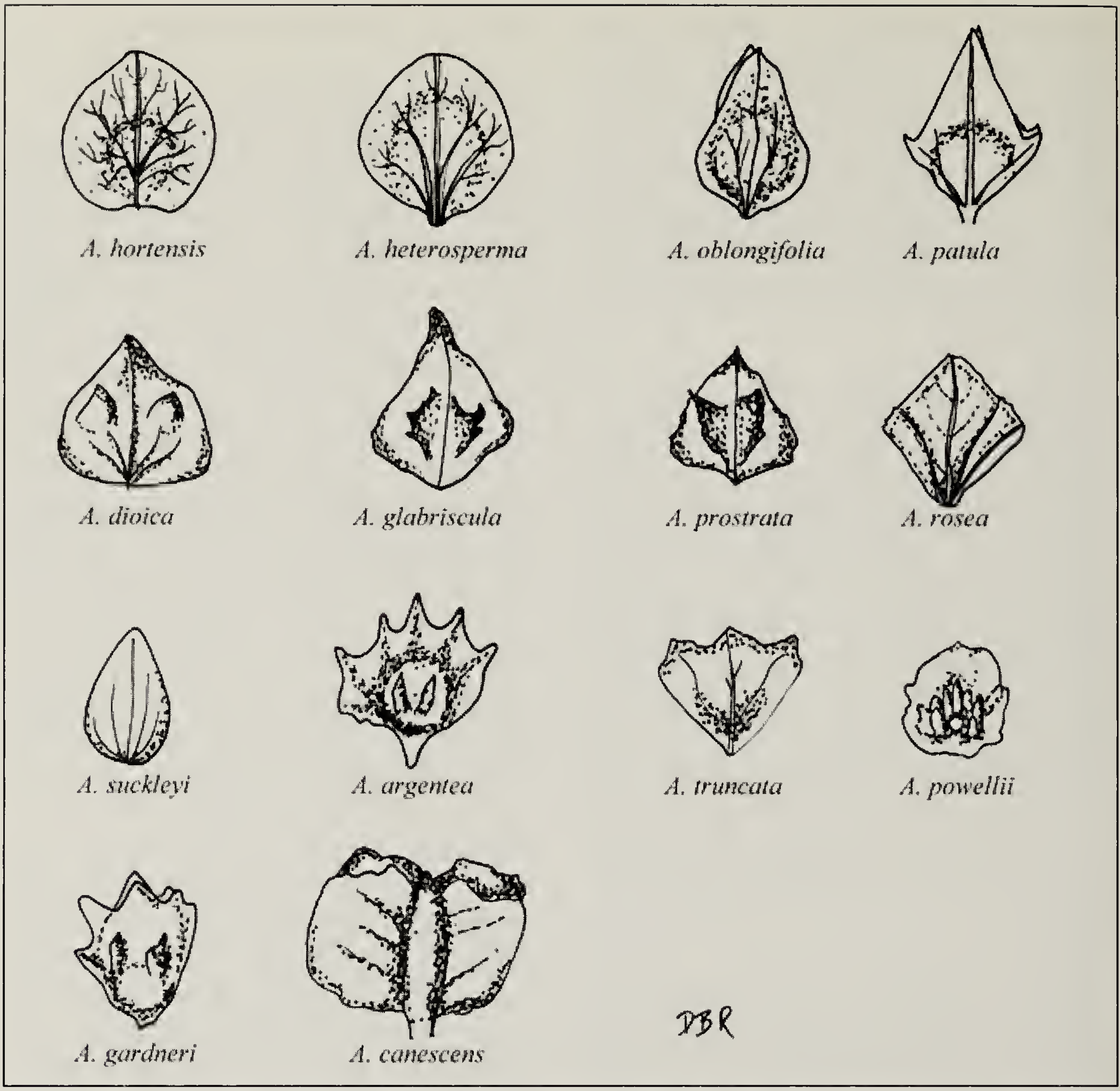

Figure 2. Saltbush fruiting bracteoles. Not drawn to scale. D.B. Robson

The bracteoles, a pair of leaf-like bracts enclosing the flower, are the most important diagnostic characters of the saltbushes (Figure 2).[4] Staminate flowers do not have bracteoles but pistillate flowers do, with the exception of some Garden Orache flowers. Bracteoles vary considerably in their shape, size, venation and texture. Bracteoles can be thin and membranous or thick, inflated and "spongy" in appearance. Many bracteoles are covered with protrusions called tubercules while others are smooth. Within a species there can also be variability in the appearance of the bracteoles: some are smooth while some have tubercules. For this reason, it is useful to look closely at several bracteoles on each plant to ensure that you observe the variety of textures that can occur.

Another unusual character of some saltbushes is the presence of two kinds of flowers and seeds.[4] These plants are called dimorphic, meaning they have two forms. In dimorphic plants, some flowers have large, brown, vertical seeds while others produce small, black, horizontal seeds. The seeds also differ physiologically. The larger seeds are more salt-tolerant than the small seeds, however, the smaller seeds can remain dormant for longer periods of time, germinating when soil salinity is

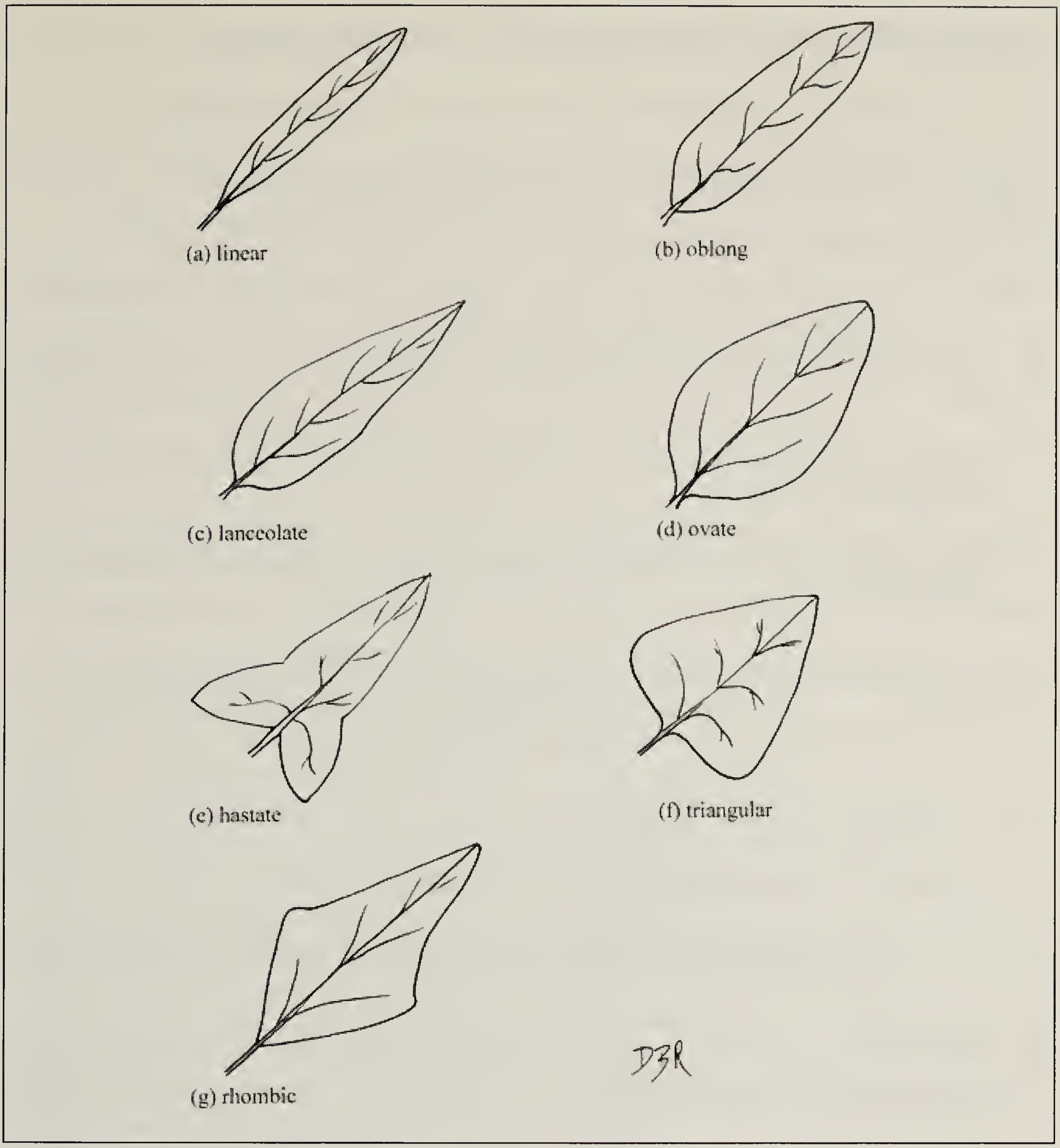

Figure 3. Leaf shapes common to saltbush species: (a) linear (b) oblong (c) lanceolate (d) ovate (e) hastate (f) triangular (g) rhombic. *D.B. Robson*

not as high, such as in the spring.[5, 20] Eight species of saltbushes in the Canadian prairie have dimorphic seeds and six have monomorphic (i.e. one kind) seeds.[4]

Description of Atriplex [4, 9, 11, 13, 17, 19]

This genus contains a few perennial shrubs but mainly annual herbs, which are glabrous (i.e. smooth, lacking hairs or glands) or scurfy (i.e. covered with bladder-like hairs). The stems are erect to prostrate, typically branched and unarmed. The leaves are alternate, opposite or subopposite on the stem, with the upper leaves often smaller and of a different shape than the lower ones, stalked or rarely sessile, blades are linear, oblong, lanceolate, ovate, hastate, triangular or rhombic in shape (Figure 3), with blade margins that are entire, toothed, wavy or lobed near the base, Kranz or regular reticulate venation, green, silvery or white in colour and a sparsely to densely scurfy texture. The plants can be monoecious or dioecious. The inflorescences consist of both axillary and terminal

Identification Key to the Saltbushes of the Prairies [4, 9, 11, 13, 17, 19]

1a. Perennial shrub or subshrub; leaves linear to oblong, not lobed 2

1b. Annual herbs; leaves typically broader, often hastate and lobed 3

2a. Shrubs to 60 cm tall; bracteoles with four prominent wings; rare .... *A. canescens*

2b. Subshrubs to 40 cm tall; bracteoles with tubercules or short wings; common .... *A. gardneri*

3a. Leaves usually green on both surfaces, glabrous or sparingly powdery or finely scurfy at maturity 4

3b. Leaves white to grey, densely and finely scurfy at maturity, especially on the underside 10

4a. Bracteoles herbaceous or membranous with no spongy inner tissue 5

4b. Bracteoles thickened, especially at the base, with spongy inner tissue 8

5a. Bracteoles orbicular, always entire 6

5b. Bracteoles ovate, triangular or rhombic, may be toothed 7

6a. Bracteoles large (to 15 mm long), subcordate or broadly rounded at base, veins merging above the base (see Figure 2) ....*A. hortensis*

6b. Bracteoles small (to 6 mm long), slightly pointed at the base, veins merging only at the base (see Figure 2) .... *A. heterosperma*

7a. Bracteoles rhombic; terminal inflorescence of densely spaced glomerules; upper leaves green .... *A. patula*

7b. Bracteoles ovate or triangular-ovate; terminal inflorescence of loosely spaced glomerules; upper leaves whitish below .... *A. oblongifolia*

8a. Lower leaves linear or ovate-lanceolate ....*A. dioica*

8b. Lower leaves triangular 9

9a. Inflorescence with leafy bracts to the tip; bracteoles thick and spongy; seeds mostly more than 2.5 mm, only slightly dimorphic (of two kinds) .... *A. glabriuscula*

9b. Inflorescence with leafy bracts only at base; bracteoles thin to slightly spongy; seeds mostly less than 2.5 mm, distinctly dimorphic .... *A. prostrata*

10a. Lower leaves sinuate-dentate, to about 3 cm long .... *A. rosea*

10b. Lower leaves entire 11

11a. Sepals of staminate flowers pink, fused into a cup-shape and fleshy-lobed on back; pistillate bracteole ovate, entire .... *A. suckleyi*

11b. Sepals of staminate flowers green, not cup-shaped, lobes ovate, rounded on back; pistillate bracteole lanceolate, lobed, wavy or toothed 12

12a. Pistillate bracteoles obovate, 4-8 mm long .... *A. argentea*

12b. Pistillate bracteoles cuneate, spatulate or oblong, less than 4 mm long 13

13a. Pistillate bracteoles 2-3 mm long, cuneate and with three teeth at summit, smooth or with 1 or 2 small tubercles; leaves sessile or subsessile, not conspicuously nerved .... *A. truncata*

13b. Pistillate bracteoles 3-4 mm long, spatulate to oblong, with short tubercules; lower leaves stalked, conspicuously 3-nerved .... *A. powellii*

spikes or spike-like panicles that may have leafy bracts at the base or scattered along the entire length. The flowers are imperfect and often occur in clusters called glomerules (i.e. dense, often rounded clusters of flowers). The staminate flowers are small and greenish, with no bracts or petals, but with a calyx of 3-5 partly fused sepals and 3-5 stamens. The pistillate flowers have 2 stigmas and a superior ovary, usually lack sepals and petals, and are subtended instead by two bracteoles that are distinct or fused at the base, membranous or with a layer of spongy tissue, round, lanceolate, ovate, triangular or rhombic in shape, margins entire, toothed or winged, surface smooth or possessing tubercules. The fruits are flattened, mainly vertical utricles (i.e. one-seeded fruits with thin, bladdery, inflated pericarps that are readily separable from the seed), or in many species dimorphic with large, brown and smaller, black seeds. The pericarp of the fruit usually comes off readily as the fruit is removed from the bracteoles and is rarely observed.

The imperfect flowers and the presence of bracteole pairs differentiate saltbushes from their close relatives the goosefoots (*Chenopodium*). Some saltbush species also resemble the docks (*Rumex*) but this genus has three bracteoles not two as in the saltbushes.

Descriptions of Saltbush Species [4, 9, 11, 13, 17, 19]

The plants are arranged alphabetically by their scientific names. After each name there is a list of the synonyms for that species. (A synonym is a name that was formerly used for the plant.) The flowering period is noted in the descriptions; it can vary considerably depending on the geographic location and weather conditions.[4]

1. *Atriplex argentea* Nutt. var. *argentea* – Silvery Saltbush or Silverscale

A bushy annual growing 15-80 cm high, but usually smaller than 40 cm. Stem angled, stout and whitish scurfy when young. Leaves greyish green, scurfy, with Kranz venation, to 3 cm long and 2.5-3 cm wide, lower leaves usually opposite and stalked, the upper alternate and sessile or nearly so; blades ovate, deltoid or lanceolate, apex acute to obtuse, base hastate to cuneate, margins entire or wavy. Monoecious with staminate flowers usually in terminal interrupted spikes, and pistillate flowers in axillary clusters. Staminate flowers with 4-5 sepals. Bracteoles of pistillate flowers obovate, thick but not spongy, united to the middle, firmly enclosing the fruit, the margins green and more or less toothed, surface smooth or with tubercules and 4-5 (8) mm long. Seeds rounded with a protruding tip, brown and to 1.7 mm long. June-August. Native and uncommon in saline flats and similar sites in southern Alberta and Saskatchewan, rare in Manitoba.

2. *Atriplex canescens* (Pursh) Nutt. var. *canescens* – Four-wing Saltbush

A perennial shrub, erect or semi-erect and branching from a woody base with upper stems herbaceous, 15-60 cm high. Leaves deciduous, whitish grey to pale green, densely scurfy, with Kranz venation, 10-40 mm long and 3-8 mm wide, alternate or nearly sessile; blade linear to oblong, oblanceolate or obovate, apex retuse to obtuse, base acute, margin entire. Dioecious or rarely monoecious; flowers in leafy panicles. Staminate flowers yellow to light brown, in clusters, 2-3 mm wide. Bracteoles of pistillate flowers in clusters with 1-8 mm long petioles, surface smooth or reticulate, ellipsoid with four prominent wings extending the bract length, apex toothed, margin dentate to entire, 8-25 mm long. Seeds teardrop-shaped, brown and 1.5-2.5 mm long. July-August. Native and rare in saline flats of southern Alberta.

3. *Atriplex dioica* Raf. - Thickleaf Orache or Saline Saltbush [*A. subspicata* (Nutt.) Rydb., *A. patula* L. var. *subspicata* (Nutt.) S. Wats., *A. p.* ssp. *p.* (Nutt.) Fosb., *A. p.* ssp. *hastata* auct. p.p. non (L.) Gray. Please note that *A. dioica* (Nutt.) Macbr. is the synonym for *A. suckleyi* (Torr.) Rydb.]

An erect herbaceous annual, 3-15 dm tall. Stems angular and reddish. Leaves green to greyish green, reddish at maturity, scurfy, 2-12 cm long and 0.5-6 cm wide, opposite or subopposite, petiolate or the upper sessile, blade narrowly to broadly lanceolate to lanceolate-linear, apex acute to rounded, often with a pair of narrow, straight or forward-curving lobes towards the base, margin irregularly toothed to entire. Monoecious; flowers in glomerules, arranged in continuous or interrupted terminal and axillary spikes, and 2-9 cm long. Bracteoles of pistillate flowers green, blackening with age, with an inner spongy tissue, triangular to ovate-triangular, margins united at base and entire or short-toothed, dorsal surface smooth or with one or more tubercules, 3-10 mm long. Seeds are round and of two kinds: some brown, dull and 1.5-3 mm long, and others shiny, black and 1-2 mm long. July-August. Native and uncommon in saline and alkaline prairie, parkland and southern boreal forest of the Prairie Provinces.

4. *Atriplex gardneri* (Moq.-Tan.) D. Dietrich – Gardner's Saltbush, Nuttall's Saltbush, Moundscale, Salt-sage

[*A. nuttallii* auct. p.p. non S. Wats., *A. n.* ssp. *gardneri* (Moq.) Hall & Clements, *A. n.* ssp. *buxifolia* (Rydb.) Hall & Clements, *A. falcata* auct. non (M.E. Jones) Standl., *A. buxifolia* Rydb., *A. gordonii* Hook., *A. oblanceolata* Rydb., *A. aptera* A. Nels., *A. canescens* SK auct. non (Pursh) Nutt., *A. c.* var. *aptera* (A. Nels.) Welsh & C.L. Hitchc., *A. c.* ssp. *a.* (A. Nels.) Hall & Clem.]

A perennial subshrub to 40 cm high, branching from a woody base. Stems decumbent to ascending, rarely erect, whitish grey to pale green in colour, upper stems herbaceous. Leaves whitish grey to pale green, densely scurfy, with Kranz venation, 12-55 mm long and 5-12 mm wide, persistent or subpersistent, alternate or opposite to subopposite, sessile to petiolate; blade linear to oblanceolate, obovate, spatulate or orbiculate, apex retuse to obtuse or rounded, base cuneate, margin entire. Dioecious or sparingly monoecious; staminate flowers in dense spikes or panicles 3-18 cm long, pistillate flowers in spikes or panicles 8-25 cm long. Staminate flowers brown or yellow, in clusters 2-4 mm wide. Fruiting bracteoles of pistillate flowers sessile or on a 2-5 mm long stalk, with somewhat spongy inner tissue, smooth, with tubercules or four short wings, oval in shape, apex toothed, margins united at or above the middle, to 1.5 mm long. Seeds short, teardrop-shaped, tan or brown and 1.5-2.5 mm wide. July-August. Two varieties are found in the prairies and these can be distinguished using the following key:

1a Fruiting bracteoles with 4 short wings or rows of tubercules; staminate flowers yellow .... var. *aptera* (A. Nels.) Welsh & Crompton

1b. Fruiting bracteoles lacking lateral wings; staminate flowers yellow or dark brown ....var. *gardneri*

The variety *gardneri* is native and common in southern prairies, on fine-textured saline soils. The variety *aptera* (called Nelson's Saltbush) occurs on dry, mixed-grass prairie and barren clay-flats only in southern Alberta and Saskatchewan.

5. *Atriplex glabriuscula* Edmondston var. *glabriuscula* - Glabrous Orache

An annual herb, 1-10 dm tall, that is prostrate or less commonly erect and branched. Stems green-striped, weakly ridged and sparsely scurfy to glabrous. Leaves somewhat succulent, green, glabrous to sparsely powdery underneath and on veins, upper leaves smaller than lower ones, 0.5-10 cm long and 0.3-8 cm wide, alternate, petiolate; blade triangular or lance-hastate, apex acute, base cuneate, usually with a pair of upwards-curving lobes, entire or irregularly toothed. Monoecious; inflorescence of loose glomerules in leaf axils or short spikes with leafy bracts to the tip. Bracteoles of pistillate flowers green becoming black, reddish or brown, thick with spongy inner tissue, veins obscure, surface smooth or tuberculate, ovate-triangular to rhombic-triangular, apex abruptly acuminate to a thin tip, margin united almost to middle with few irregular teeth, 5-13 mm long. Seeds round to oval, of two kinds: some brown, convex and 2.5-4 mm wide, and others rarely black and 1.5-2.9 mm wide. July-August. Native and rare in saline or brackish marshes and saline coastal strands of northern Manitoba along Hudson Bay and possibly northeastern Alberta.

6. *Atriplex heterosperma* Bunge – Two-scale Saltbush

[*A. micrantha* auct. non Ledeb.]

An erect, herbaceous annual, branching from the base and 10-15 dm tall. Leaves green, scurfy below and becoming glabrate with age, to 6.5 cm long, alternate, except uppermost leaves which are opposite, with 2-3 cm long petioles; blade triangular, as long as wide, base hastate to cuneate, often with auricles. Monoecious with flowers in loosely branched terminal or axillary panicles. Staminate flowers with 5 sepals. Bracteoles membranous, not fused, slightly pointed at the base, with veins all converging at the base, smooth, orbicular-ovate, of two sizes, the larger 5-6 mm long, and the smaller

2 mm long. Seeds rounded, of two kinds: some yellow-brown, flat, dull and 2-3 mm diameter, and others black, shiny, biconvex and to 1.5 mm. August-September. Introduced and uncommon on roadsides and waste ground in Alberta and possibly Saskatchewan.

7. *Atriplex hortensis* L. – Garden Orache or French Spinach (See photograph on inside back cover, top)

A fairly tall, erect to half decumbent, highly branched, annual plant, 60-120 cm high. Leaves green, sparsely scurfy becoming glabrous with age, 15-180 mm long and 8-135 mm wide, opposite or alternate, with 0.3-4 cm petioles, blade cordate, triangular to triangular ovate with a hastate base, apex attenuate to acuminate or rounded, entire or irregularly toothed. Monoecious; flowers in spikes of leafless panicles. Staminate flowers with 5 sepals. Pistillate flowers of two kinds: some lacking bracts but with a 5-parted calyx, and others with bracteoles instead of a calyx. Bracteoles membranous, entire, surface smooth, united only at base, with veins merging above the base, orbicular-ovate, subcordate or broadly rounded at base, 5-18 mm long. Seeds rounded, of two kinds: those enclosed in bracteoles yellow-brown, flat, dull and 2-3 mm diameter, and those in the calyx, black, shiny, biconvex and to 1.5 mm. July-August. Introduced and common. A garden escape that has become very common around towns and cities in all three Prairie Provinces.

8. *Atriplex oblongifolia* Waldst. & Kit. - Oblong-leaf Orache

An erect annual to 12 dm tall that branches from the base. Leaves green above, whitish and scurfy underneath becoming glabrous with age, up to 7 cm long and 2.5 cm wide, alternate except near the base, with 0.5-3 cm long petioles; blade oblong-lanceolate, widest near the cuneate or hastate base, apex acute, margin entire or irregularly dentate. Monoecious; flowers in loosely spaced, terminal or axillary inflorescences that elongate at maturity. Staminate flowers with 5 sepals. Bracteoles of pistillate flowers thin, smooth and lacking appendages, ovoid-rhombic or triangular-ovate, acute to rounded at apex, margins entire, of two sizes, the larger to 5-6 mm long, and the smaller ones 2 mm long. Seeds rounded, of two kinds: some yellow-brown, flat, dull and 2-4 mm diameter, and others black, shiny and to 1.5 mm in diameter. August-September. Introduced but rare in Alberta and possibly Saskatchewan along roadsides and waste ground.

9. *Atriplex patula* L. – Spreading Orache, Spear Saltbush, Fat-hen Saltbush or Spear-scale

[*A. hastata* ssp. *patula* (L.) S. Pons., *A. h.* var. *patula* (L.) Farwell, *A. patula* var. *bracteata* auct. non Westerl., *A. p.* var. *japonica* Level., *Teutiopsis patula* (L.) Selak]

An annual herb that is erect or less commonly prostrate, simple or branched and 15-150 cm tall. Stems opposite to subopposite, straight with green stripes. Leaves green, glabrous to sparsely powdery underneath, 2.5-12 cm long and 3-40 mm wide, alternate above, with 0.5-2 cm petioles, upper leaf blades lanceolate to oblong-linear, lower leaf blades rhombic-lanceolate or hastate-ovate, apex acute, base cuneate or hastate, margin entire or irregularly toothed. Monoecious or rarely dioecious; flowers in dense glomerules, arranged in interrupted axillary and terminal spikes that have leafy bracts only at the base. Staminate flowers mostly with 5 sepals. Bracteoles thin, green becoming black, rhombic to rhombic-triangular or ovate-rhombic, apex acute, base mostly hastate, margin united almost to middle, entire or sparingly toothed, tuberculate, 2-7 mm long. Seeds round, of two kinds: some brown and 2.5-3 mm wide, and others black and 1-2 mm wide. Often mistaken for Lamb's-quarters. July-September. Introduced and uncommon on disturbed and saline areas in prairies and parklands.

10. *Atriplex powellii* S. Wats. var. *powellii* – Powell's Saltbush

Annual herb, branched from the base with the lower branches curving upwards and longer than the upper ones, and 10-50 cm high. Leaves grey and scurfy, conspicuously 3-nerved, with Kranz venation, 5-25 mm long and about as wide, alternate, lower leaves petiolate, upper leaves sessile; blade deltoid-ovate to orbicular-ovate or cordate-ovate to elliptic, base obtuse to cuneate, margin entire or undulate. Dioecious or sparingly monoecious; flowers in glomerules in terminal and axillary spikes. Staminate flowers with 4-5 sepals. Bracteoles of pistillate flowers sessile, united to the apex and firmly enclosing the fruit , thick but not spongy, surface smooth or with few to many tubercules, spatulate to oblong, the margins more or less toothed, 3-4 mm long and nearly as wide. Seeds rounded, light brown to yellowish brown and 1.5 mm long. July-August. Native and rare on sub-saline clay flats, badlands and alkali flats in Alberta and Saskatchewan.

11. *Atriplex prostrata* Bouch. ex DC. – Hastate Saltbush or Halbert-leaved Saltbush

[*A. hastata* auct. non L., *A. latifolia* Wahl., *A. patula* L. var. *triangularis* (Willd.) Thorne & Welsh, *A. patula* var. *hastata* auct. non (L.) Gray, *A. prostrata* var. *triangularis* (Willd.) Rausch, *A. t.* Willd.]

An annual herb that is erect, procumbent or decumbent and branched from the base, 1-10 dm tall. Branches opposite or subopposite each other with green stripes. Leaves somewhat succulent, green, glabrous to sparsely powdery underneath and on veins, upper leaves smaller than lower ones, 20-100 mm long and almost as wide, opposite or subopposite, with 1-3 cm petioles, blade triangular-hastate, usually with a pair of spreading basal lobes, apex acute to obtuse, base truncate or subcordate, margin entire, serrate, dentate or irregularly toothed. Monoecious; inflorescences of terminal and axillary spikes that are 2-9 cm long and leafy only at the base. Bracteoles green becoming black or brown at maturity, thin with some spongy inner tissue, veined or veins obscure, smooth or with 2 tubercles, ovate triangular to triangular-hastate, apex acute, margin united at base, 3-5 mm long. Seeds round, of two kinds: some brown, flat and 1-2.5 mm wide, and others black and 1-1.5 mm wide. July-August. Introduced and common on slough edges, alkaline and saline flats in prairie, parkland and southern boreal forest.

12. *Atriplex rosea* L. – Tumbling Orache, Red Orache or Red-scale

An erect annual herb, simple or branched, whitish scurfy or glabrate and 1-10 (-20) dm tall. Leaves grey or whitish, rarely green, prominently 3-veined with Kranz venation, 12-80 mm long and 6-50 mm wide, alternate, upper sessile, lower short petiolate; blade lanceolate to ovate, apex acute to obtuse, margin sinuate-dentate and often lobed. Monoecious; flowers in glomerules arranged in slender, simple or paniculate spikes that lack or have a few leafy bracts. Staminate flowers with 4-5 sepals. Bracteoles of pistillate flowers sessile, united to near the middle, surface smooth or with short tubercules, strongly 3 veined, rhombic or ovate, margin dentate, 4-8 mm long.

Seeds dull brown and 1.5-2 mm across. July-August. Introduced and uncommon on roadsides and waste ground in southern prairies.

13. *Atriplex suckleyi* (Torr.) Rydb. – Suckley's Orache or Rillscale

[*Atriplex dioica* (Nutt.) Macbr. *Endolepis dioica* (Nutt.) Standl. *E. suckleyi* Torr.]

A low, erect, annual herb, spreading and branching from the base, almost glabrous, to 30 cm high. Stems often tinged with red, sparsely mealy or glabrous. Leaves thick, succulent, with 1 nerve, pale green, sparsely scurfy when young, 7-35 mm long and 4-10 mm wide, alternate, sessile; blade lanceolate to elliptic or less commonly ovate, apex acute or acuminate, margins entire. Monoecious with male flowers in small glomerules mostly arranged in terminal spikes, female flowers solitary to few, in leaf axils. Staminate flowers with a cup-shaped, pinkish calyx that has fleshy lobes; stamens 5. Pistillate flowers with 3-4 sepals that are distinct, obtuse, entire or lobed and with hyaline margins. Bracteoles of pistillate flowers membranous, sessile, united to apex, smooth, scurfy, ovate, 1 mm long and 1.5 mm wide. Seeds ovate, brown, 1.5 mm long and 1.2 mm wide. June-August. Native and uncommon, but plentiful locally. Found on saline flats, eroded clay slopes, and badlands throughout southern Prairies.

14. *Atriplex truncata* (Torr. ex S. Wats.) A. Gray - Wedgescale or Wedge-leaved Saltbush

An erect, herbaceous annual, often freely branched, 2-8 (10) dm tall. Stems obtusely angled, scurfy becoming glabrate. Leaves grey-scurfy or the upper surface glabrate, with Kranz venation, not conspicuously nerved, 4-30 mm long and 3-30 mm wide, alternate or uppermost leaves opposite, sessile or subsessile; blade broadly ovate to deltoid or oval, apex acute to obtuse, base cuneate to subcordate or somewhat hastate, margin entire or dentate and sometimes undulate. Monoecious with flowers in glomerules arranged mainly in axillary spikes. Staminate flowers with 3-5 sepals. Bracteoles of pistillate flowers cuneate, with 3 teeth at the apex or broadly rounded, surface smooth or with 1 or 2 small tubercules, 2-3 mm long and as wide. Seeds round, brown and about 1.5 mm across. July-August. Native and rare on dry, alkaline flats, slopes and sloughs in Alberta and Saskatchewan.

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DISPLACEMENT

A raven landing
on snow-laden branches
sends an instant shower
down upon house finches
huddled far below him
a second snow fall for them.

Victor C. Friesen

RESULTS OF THE 2008 INTERNATIONAL BUTTERFLY COUNT IN SASKATCHEWAN

MIKE GOLLOP, 51 Welker Crescent, Saskatoon, SK, S7H 3M3 and ANNA LEIGHTON, 328 Saskatchewan Crescent West, Saskatoon, SK, S7M 0A4

Nine International Butterfly Counts (1JC) were conducted in Saskatchewan in 2008, the same as in 2007 and one more than in 2006. Counts in 2008 were conducted at Bjorkdale, Fort Qu'Appelle, Last Mountain Lake National Wildlife Area, Nisbet Forest, Pasquia Hills, Preeceville, Regina, Saskatoon and Waskesiu River. The Waskesiu River count was last conducted in 2006. Duck Mountain Park was the only count done in 2007 that was not repeated in 2008. Count statistics are presented in Table 1, and count results in Table 2.

There were 66 species recorded in 2008 compared to 60 in 2007, 62 in 2006 and 57 in 2005.[1,2,3] The total number of butterflies counted was 4983 compared to 4007 in 2007, 3669 in 2006, and 6972 in 2005, of which 5389 were Painted Ladies. Butterflies per party-hour (ph) is used as a measure to relate butterfly numbers to observer effort so as to provide a comparable index of abundance over years. Butterflies per party-hour was 62 in 2008 for the nine counts compared to 48 in 2007 and 2006 and 86 in 2005, although again, if Painted Ladies are removed from the 2005 count, the butterflies per party-hour would be only 27. It appears from this that overall numbers of butterflies were up in 2008 but such provincial averaging may mask local results. In general the more southerly counts and those held earlier in the year had significantly fewer butterflies than did the later counts along the forest fringe.

Count conditions in 2008 were variable. Temperatures ranged from a low of 16° at Waskesiu River to a high of 28° at Pasquia Hills. Wind speeds exceeding 30 km/hr at Pasquia Hills, Preeceville, Regina and Saskatoon may have had some negative influence on the number of open field butterflies that would have been seen. Lack of sun (< 50% of count period) may also have negatively influenced counts at Last Mountain Lake and Preeceville.

Species totals on the counts ranged from 15 at Last Mountain Lake to 31 at Bjorkdale and averaged 22 for the nine counts. This was down from 24 in 2007 but up from 20 in 2006 and 18 in 2005. Anything more than 20 species is very respectable for a single-day butterfly count and over 30 is exceptional. Only five counts exceeded 20 species in 2008, whereas seven did in 2007.

Numbers of individuals ranged from 139 at Last Mountain Lake to 1733 at Pasquia Hills. This compares to a range of 153 at Last Mountain Lake and 1013 at Bjorkdale in 2007 and 115 at Fort Qu'Appelle and 1152 at Eastend in 2006. The number of individuals per party-hour ranged from 15 at Last Mountain lake and Saskatoon to 173 at Pasquia Hills. This compares with a range from 22 at Last Mountain Lake to 127 at Bjorkdale in 2007 and from 19 at Fort Qu'Appelle to 164 at Eastend in 2006.

Table 1. 1JC statistics - Saskatchewan 2008

1JC name	yrs. held	1JC date	no. of spp.	no. of b'flies	b'flies/ ph	no. of obs.	no. of ph	ph on foot	km on foot	km by car	time start – end	% sun* am	% sun pm	temp. deg.C	wind km/hr
WaR	11	2 JN	22	155	17	3	9	9	10.8	0	1015–1710	76–100	<25	16–19	8–8
Reg	13	19 JN	19	391	39	7	10	10	4.8	0	0830–1500	95	95	17–25	17–35
FtQ	18	21 JN	23	187	27	7	7		8	32	0930–1600	100	75	23	8
Sto	14	5 JY	25	326	15	11	22	26	11.2	45	0930–1800	51–75	<25	21–26	27–37
LML	2	8 JY	15	139	15	4	9.5	9.5	6.4	0	1000–1700	<25	26–50	17–20	19–13
Bjo	8	18 JY	31	1206	134	1	9	2	5	35	0900–1800	100	75	17–23	0–16
Pre	7	19 JY	18	428	66	3	6.5	6.5	5		0800–1450	<25	<25	19–25	24–32
PaH	8	22 JY	30	1733	173	1	10	2	3	25	0830–1830	100	65	22–28	16–32
NiF	13	5 AU	19	418	70	3	6	6	8	0	1000–1700	51–75	51–75	20– 23	8–16
totals		9 1JCs	66	4983	62	30	89				0800–1830	<25–100	<25–95	16–28	0–35

Abbreviations: spp. = species, ph = party hours, b'flies = butterflies, obs. = observers,
Bjo = Bjorkdale, FtQ = Fort Qu'Appelle, LML = Last Mountain Lake National Wildlife Area, NiF = Nisbet Forest,
PaH = Pasquia Hills, Reg = Regina, Sto = Saskatoon, WaR = Waskesiu River

* The format of the % sun columns has changed to accomodate new North American Butterfly Association categories used by some compilers. The categories are 11%-25%, 26%–50%, 51%–75%, 76%–100% .

** The "total" in column 6 is the average for all counts, not the total; that in column 7 is the total number of people who participated in 1JC counts (some participated in more than one count), totals in columns 12 - 16 are extremes in 2008

Table 2. 1JC results - Saskatchewan 2008

SPECIES NAME	WaR	Reg	FtQ	Sto	LML	Bjo	Pre	PaH	NiF	totals
	2 JN	19 JN	21 JN	5 JY	8 JY	18 JY	19 JY	22 JY	5 AU	
Silver-spotted Skipper		1		12						13
Northern Cloudywing	2		1				1			4
Unident. Duskywing	*9*									*9*
Dreamy Duskywing	17		1							18
Juvenal's Duskywing										
Afranius Duskywing										
Persius Duskywing	5									5
Grizzled Skipper										
C. Checkered Skipper			2	1						3
Common Sootywing										
Unident. Skipper				*2*	*8*					*10*
Arctic Skipper		3	6							9
Least Skipper								2		2
Garita Skipperling		1	18	8	3		6			36
European Skipper										
Uncas Skipper										
C. Branded Skipper										
Plains Skipper										
Dakota Skipper										
Nevada Skipper										
Peck's Skipper				3						3
Draco Skipper										
Tawny-edged Skipper			3	1	7		1	1		13
Long Dash Skipper				7	8	19		14		48
Rhesus Skipper										
Delaware Skipper										
Woodland Skipper										
Hobomok Skipper	2	35	5			1				43
Dun Skipper						29	4	26	16	75
Dusted Skipper										
Oslar's Roadside Skipper										
Com. Roadside Skipper	5	1	1							7
Kahli Swallowtail										
Old World Sw'tail (Dods)										
Old World Sw'tail (Huds)								10		10
Anise Swallowtail										
Anise/ Old World Sw'tail										
Can. Tiger Swallowtail	17	5	4	4		4		24		58
Unident. White		5								*5*
Western White				3		18	1			22
Margined White										
Mustard White	1					19		2		22

Count location	WaR	Reg	FtQ	Sto	LML	Bjo	Pre	PaH	NiF	totals
Cabbage White	3	9	2	9	9	142	35		1	210
Large Marble										
Olympia Marble										
Unident. Sulphur										
Clouded Sulphur	2	30	27	7	35	9	3	2	7	122
Orange Sulphur		1								1
Q. Alexandra's Sulphur										
Christina Sulphur										
Giant Sulphur								1		1
Pink-edged Sulphur						104		183		287
Harvester										
Unident. Copper										
Gray Copper										
Bronze Copper					2	1				3
Ruddy Copper										
Dorcas Copper						1		9	3	13
Purplish Copper		5			1					6
Acadian Hairstreak										
Coral Hairstreak									18	18
Edwards' Hairstreak										
Banded Hairstreak										
Striped Hairstreak				2						2
Unident. Elfin										
Brown Elfin	6									6
Hoary Elfin										
Eastern Pine Elfin	12									12
Western Pine Elfin										
Gray Hairstreak										
Unident. Blue	*7*	*23*		*20*	*9*		*3*			*62*
West. Tailed Blue	3	1	13	6		26	6	3	1	59
Spring Azure	3									3
Summer Azure										
Rocky Mt. Dotted Blue										
Arrowhead Blue										
Silvery Blue	9	44	17	29	8	35		33		175
Northern Blue						9		76		85
Melissa Blue		10	5							15
Greenish Blue		12	2	18	8	31	4	27		102
Boisduval's Blue										
Lupine (Acmon) Blue										
Prairie Arctic Blue			1						1	2
Unident. large Fritillary				*14*			*6*		*43*	*63*
Variegated Fritillary										
Great Spangled Frit.				2		66	78	8	40	194

Count location	WaR	Reg	FtQ	Sto	LML	Bjo	Pre	PaH	NiF	totals
Aphrodite Fritillary						37		13	16	66
Edwards' Fritillary										
Zerene Fritillary										
Callippe Fritillary			1							1
Atlantis Fritillary				3		85		750		838
Northwestern Fritillary			6	15		43	2	98	13	177
Mormon Fritillary										
Unident. small Fritillary	*9*								*16*	*25*
Bog Fritillary										
Silver-bordered Fritillary				1	1	2		13	3	20
Meadow Fritillary	5					4		5	9	23
Frigga Fritillary	3									3
Freija Fritillary	18									18
Arctic Fritillary							2		49	51
Gorgone Checkerspot					1					1
Sagebrush Checkerspot										
Unident. Crescent				*37*	*8*				*8*	*53*
Pearl Crescent		2	4	7						13
Northern Crescent	1		3	66	11	285	134	226	18	744
Tawny Crescent		1		1		31	18	73	1	125
Variable Checkerspot										
Unident. Comma				*1*						*1*
Eastern Comma										
Satyr Comma	1			6		5	1			13
Green Comma	5							2		7
Hoary Comma								2		2
Gray Comma						8		1		9
Unident. Nymphalids		2								2
Compton Tortoiseshell	3									3
Mourning Cloak	7								3	10
Milbert's Tortoiseshell						4		3	2	9
Painted Lady		12			1					13
Red Admiral										
White Admiral			1	29	4	86	23	96	1	240
Viceroy						3		7		10
Northern Pearly-Eye						65	70	23		158
Eyed Brown										
Little Wood-Satyr										
Common Ringlet		183	63	11	13	2				272
Unident. Wood-Nymph										
Com. Wood-Nymph						32	30		149	211
Small Wood-Nymph										
Unident. Alpine										
Taiga Alpine										

Count location	WaR	Reg	FtQ	Sto	LML	Bjo	Pre	PaH	NiF	totals
Red-disked Alpine										
Common Alpine				1						1
Ridings' Satyr										
Unident. Arctic										
Macoun's Arctic										
Uhler's Arctic		5	1							6
Jutta Arctic										
Monarch										
Unident. butterfly					2					2
Total number of butterflies	155	391	187	326	139	1206	428	1733	418	4983
Total number of species	22	19	23	25	15	31	18	30	19	
Count location	WaR	Reg	FtQ	Sto	LML	Bjo	Pre	PaH	NiF	totals

Bjo = Bjorkdale, FtQ =Fort Qu'Appelle, LML=Last Mt. Lake National Wildlife Area, NiF=Nisbet Forest, Pre = Preeceville, PaH = Pasquia Hills, Sto = Saskatoon, Reg = Regina, WaR = Waskesiu River

Group of Old World Swallowtails and Canadian Tiger Swallowtails, 20 June 2008, John Kozial

The number of observers ranged from one at Bjorkdale and Pasquia Hills to 11 at Saskatoon compared to highs of 13 and 11, also at Saskatoon in 2007 and 2006 respectively. There was a total of 89 party-hours logged ranging from six ph at Nisbet Forest to 22 ph at Saskatoon. This compares with 96 party hours in 2007 and 77 in 2006.

The highest combined total from all counts of individual species in 2008 was 838 for Atlantis Fritillary, including an amazing 750 at Pasquia Hills. Other unusually high species counts at individual locations were 19 Long Dash Skippers at Bjorkdale, 29 and 26 Dun Skippers at Bjorkdale and Pasquia Hills respectively, 183 and 104 Pink-edged Sulphurs at Pasquia Hills and Bjorkdale, 18 Coral Hairstreaks at Nisbet Forest, 76 Northern Blues at Pasquia Hills, 285, 226 and 134 Northern Crescents at Bjorkdale, Pasquia Hills and Preeceville, 73, 31 and 18 Tawny Crescents at Pasquia Hills, Bjorkdale and Preeceville, 96 and 86 White Admirals at Pasquia Hills and Bjorkdale, and 70 and 65 Northern Pearly-Eyes at Preeceville and Bjorkdale.

It was a poor year for transient species. Common Checkered Skippers were present on two counts (a total of 2 individuals), Orange Sulphur on one (1) and Painted Ladies on two (12). There were no Variegated Fritillaries, Red Admirals or Monarchs.

Virtually all of the common non-transient species that might be expected considering the dates and locations of the nine counts were found in 2008. There were no new species for the Saskatchewan 1JC. John Kozial notes "the two male specimens of *Polygonia gracilis gracilis* observed and collected in the Pasquia Hills 1JC count in 2008 represent the most southerly known collection location in the province, outside the Precambrian area. There is only one additional record (a single specimen at Candle Lake) south of the Precambrian area; that location is, however farther north than the Pasquia Hills location. There are a small number of widely scattered records for the Precambrian area of northern Saskatchewan (pers. comm. R. Hooper)." Other more unusual species noted included two Least Skippers and one Giant Sulphur at Pasquia Hills. A single Hobomok Skipper at Bjorkdale on July 18 was unusually late as was a Western-tailed Blue at Nisbet Forest on August 5. The previous late dates for Saskatchewan were July 14 and August 4 respectively.

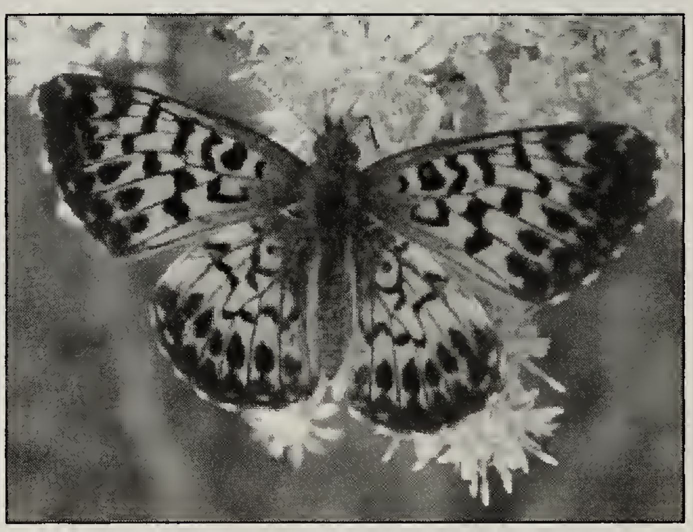
Acknowledgements

We'd like to thank the count participants, and the count leaders and compilers Dallas Fairburn, Ron Hooper, John Kozial, Ray Poulin and Michael Williams.

1. GOLLOP, M. and A. LEIGHTON. 2005. Results of the 2005 International Butterfly Counts in Saskatchewan. *Blue Jay* 63:193-199

2. GOLLOP, M. and A. LEIGHTON. 2007. Results of the 2006 International Butterfly Counts in Saskatchewan. *Blue Jay* 65:89-95

3. GOLLOP, M and A. LEIGHTON. 2007. Results of the 2007 International Butterfly Counts in Saskatchewan. *Blue Jay* 65:211-217



Aberrant form of Arctic Fritillary, 2 August 2008. John Kozial

ECOLOGY, CONSERVATION, AND STATUS OF REPTILES IN CANADA

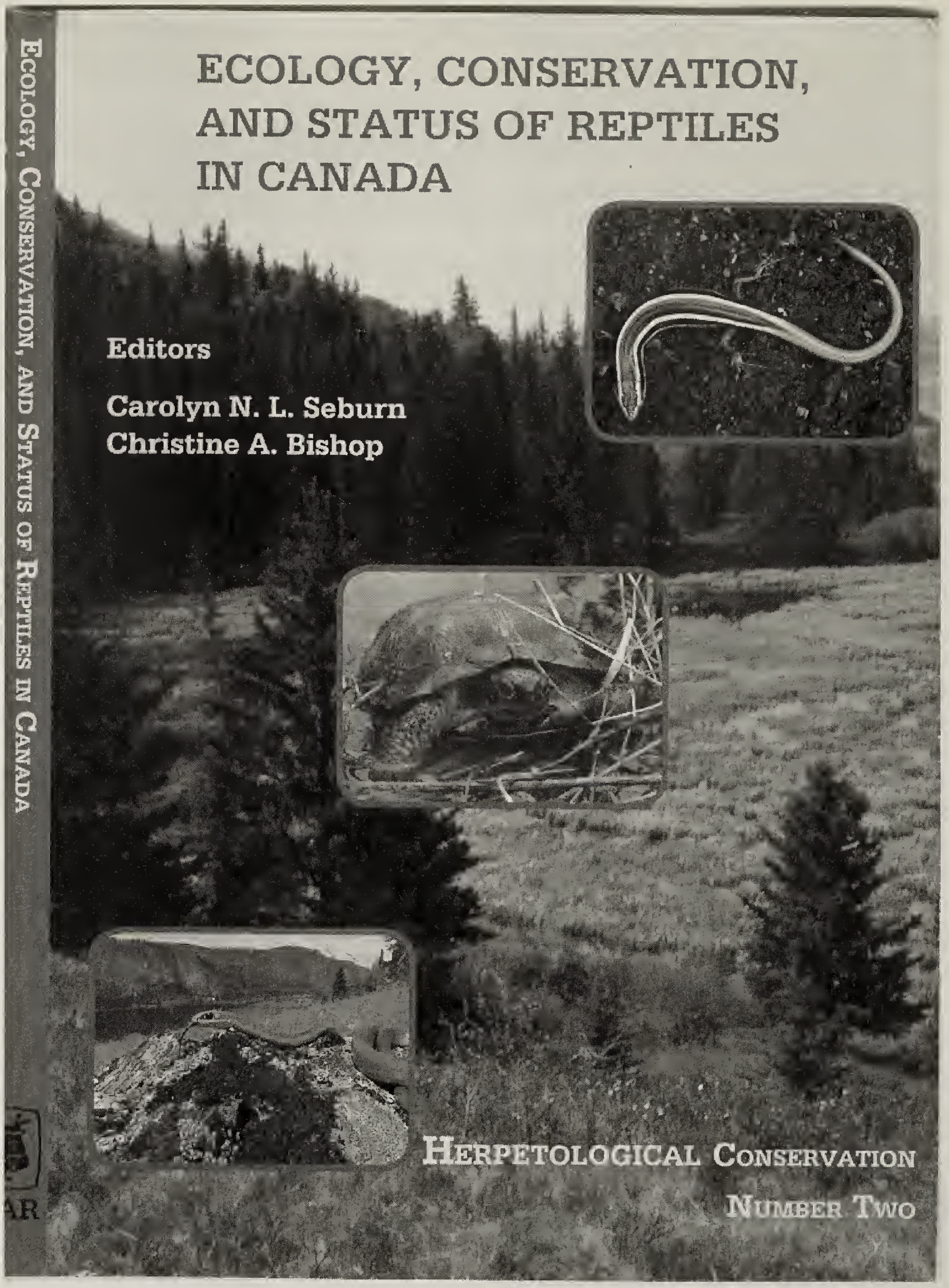
CAROLYN N. L. SEBURN AND CHRISTINE A. BISHOP (eds.). 2007. Number Two in the Herpetological Conservation series, Society for the Study of Amphibians and Reptiles published in association with the Canadian Amphibian and Reptile Conservation Network, Salt Lake City, UT. 26 cm by 19 cm. Hard Cover. 246 pages. Black and white photographs throughout. 1SBN 978-0-916984-70-0. $40.00 US.

Disappearing amphibians have received worldwide attention since the early 1990s. *Ecology, Conservation, and Status of Reptiles in Canada*, which flowed from a 1998 conference in Saskatoon, makes a strong case for many Canadian reptiles being in equal or greater difficulty. In this comprehensive volume, Canada's leading herpetologists unite to provide a science-based assessment of the survival needs of native turtles, lizards and snakes.

Ecology, Conservation, and Status of Reptiles in Canada notes that, in 2006, 30 of 46 Canadian species were listed by COSEWIC (Committee on the Status of Endangered Wildlife in Canada) as at risk nationally, a substantially higher proportion than either birds or mammals. (Although no additional species have been added since the book's publication, five species, subspecies or populations have been up listed to a less secure status, including Saskatchewan and Alberta's Greater Short-horned Lizard, up listed to endangered.)

Our cold climate does not favour reptiles, causing delayed maturity, frequent reproductive failure and hibernation stress. Compared to more southerly populations, Canadian species have a lower capacity to compensate for losses, and their scattered numbers hinder re-colonization. Anthropogenic pressures such as roads and urbanization further increase the pressure to survive, enhanced by the fact most reptiles and most Canadians cohabit in the same narrow strip along the American border. Seburn and Bishop's book describes and evaluates how these factors impact reptiles. Eleven chapters, supplemented by a checklist and status summary, provide an extremely detailed overview of all species.

Five of the chapters are of particular note. Chapter 2 by Francis Cook on early Canadian reptile studies traces herpetology studies from the 1600's to the present. In Chapter 3, G. Lawrence Powell and Anthony Russell give an excellent assessment of Canadian lizards' life histories and problems, examining both in the context of their North American range. Patrick Gregory in Chapter 4 provides a particularly good analysis of adjustments in behaviour and physiology required of snakes in cold climates, with a focus on prairie snake dens. In Chapter 5, Ronald Brooks, dean of Canadian turtle researchers, provides a compelling, and depressing, thesis showing why freshwater turtles cannot be managed


ECOLOGY, CONSERVATION, AND STATUS OF REPTILES IN CANADA
Editors
Carolyn N. L. Seburn
Christine A. Bishop
HERPETOLOGICAL CONSERVATION
NUMBER TWO
ECOLOGY, CONSERVATION, AND STATUS OF REPTILES IN CANADA

like traditional density dependent species which are the norm in North American wildlife management agencies. Chapter 6, by four authors, provides extensive detail on marine turtles in Canadian waters, showing them to be much more common than previously believed, yet still under threat. The remaining chapters deal with genetics in conservation, disease, and traffic mortality, ending with a bleak assessment of reptiles' future in Canada, and a suggested conservation strategy. A checklist summarizing common and scientific names, distribution, threats and conservation status with a good quality black and white photograph of all but one species (an extirpated Eastern rattlesnake) concludes the volume.

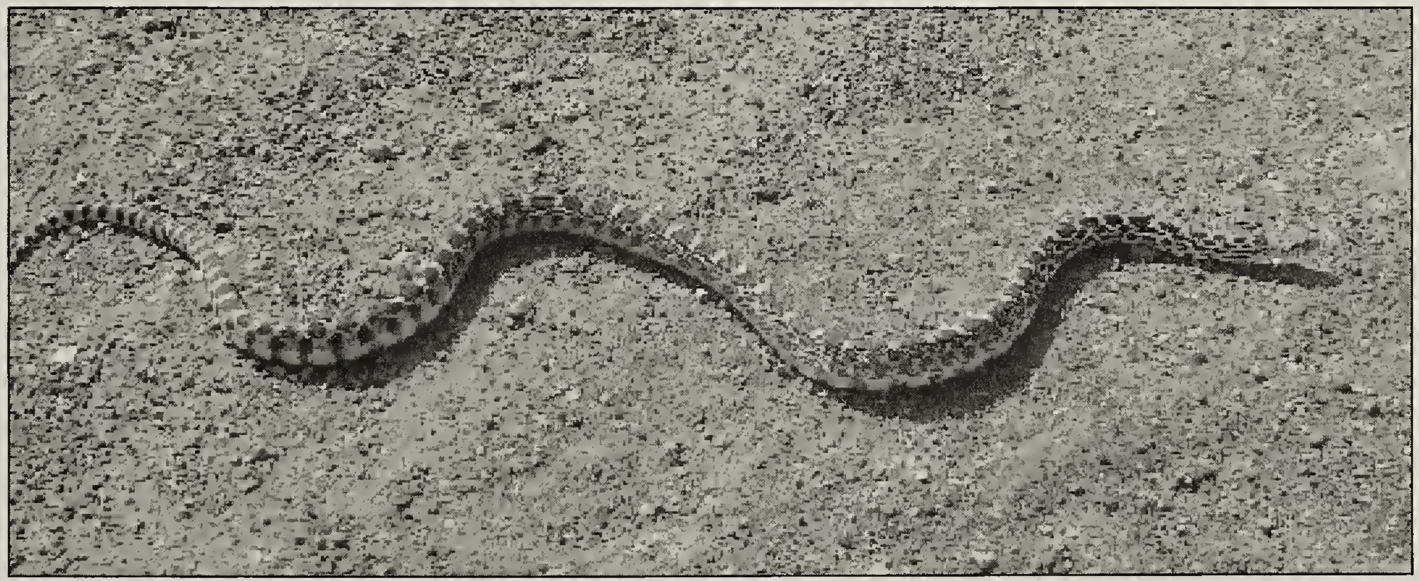
The book's great value is in providing a Canada-wide overview of reptiles by the country's most knowledgeable researchers. Abstracts preface all chapters but one, giving a quick overview of contents. The literature cited sections at the end of each chapter are immense; a random spot check did not reveal any significant omissions. Typographical errors are few.

However, a few changes could have greatly enhanced the book's stated purpose of raising awareness of reptile survival problems for people outside the herpetological community. For instance, for casual naturalists, an indication of the authors' qualifications would strengthen the message. Ease of reading could be better. Pages are dense with prose and the writing quality is uneven. Species are often, but not always, referenced by scientific name only and that is frequently abbreviated. Despite the editors' stated reliance on the Society for the Study of Amphibians and Reptiles checklist as the authority, species names frequently vary from that standard and are not consistent, further confusing the casual reader. For example, Western Rattlesnake on page 193 becomes Prairie Rattlesnake in the checklist. Eastern Foxsnake is *Elaphe gloydii* on the same page, but *Elaphe gloydi* in the checklist, which then identifies the adjacent photograph as *Elaphe vulpina*.

The checklist is the weakest part of the book. Although it packs a lot of information into a small space, the layout is poor and the information does not always match material earlier in the book e.g. Snapping Turtle and Stinkpot distribution.

Despite these shortcomings, *Ecology, Conservation, and Status of Reptiles in Canada* is an impressive volume and will be an important addition to the bookshelf of any professional, or serious amateur, herpetologist. It is to be hoped too that herpetologists and non-herpetologists alike will respond to the suggested conservation strategy in the final chapter and thwart the gloomy predictions outlined earlier in the book.

Reviewed by Carol Scott, 87 Woodgreen Place, Winnipeg, MB, R3J 1H4



Bullsnake near Kyle, SK on 1 July 2007 *Dan Zazelenchuk*

POETRY

DEER

Farm deer are curious–not odd or strange,
and certainly not strangers to the land.
They've been here all along, even before
my father came to claim this land as his,
affix a home on it and fences too
and till and sow and make the soil say wheat
instead of honeyed silver-willow patches,
squat stones, short grass, and upright trembling-leafed
white aspens.

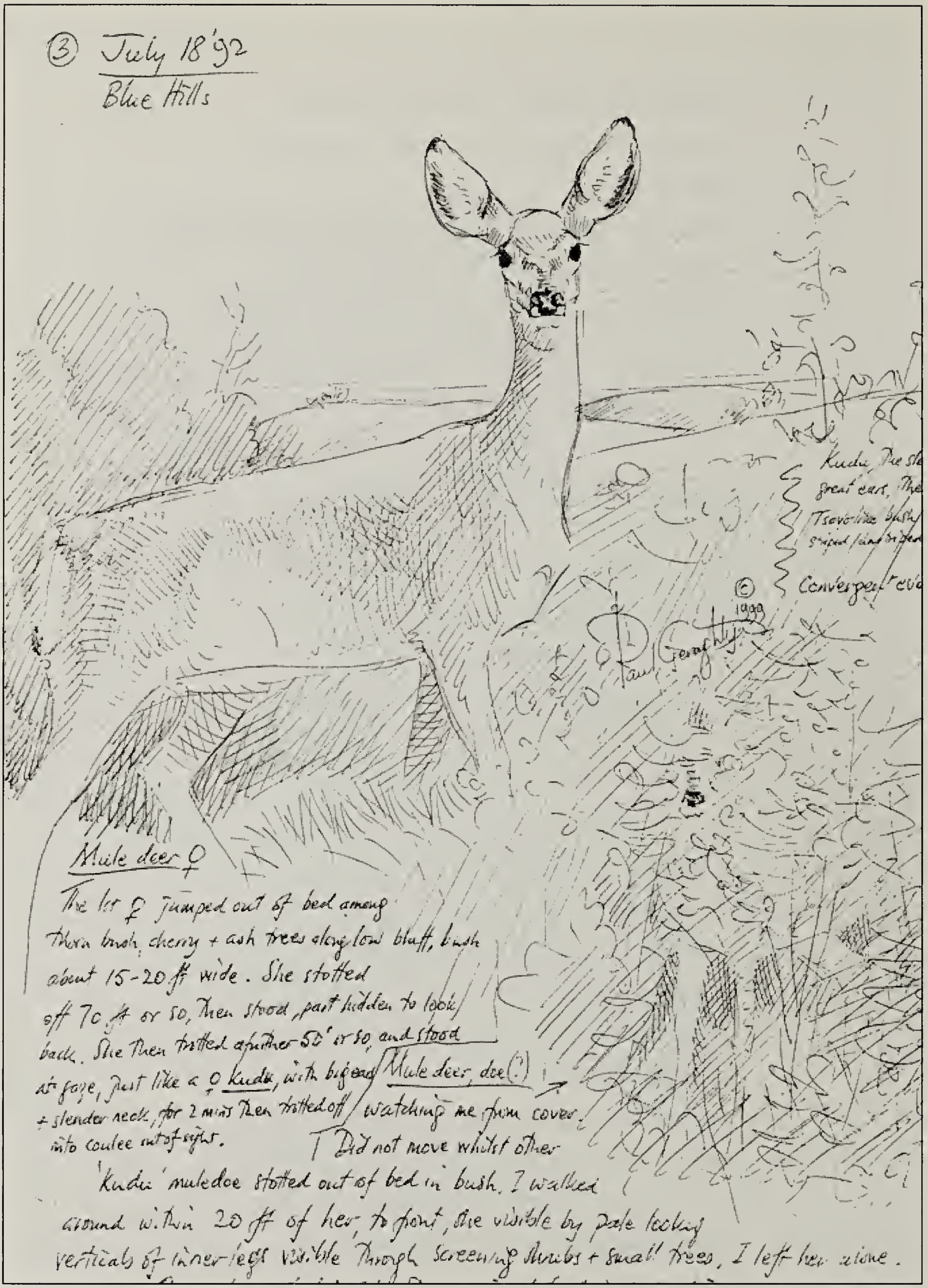
And the deer, quite rightly, think
they have at least retained some privileges,
not squatters' rights–the aforesaid squat stones
have those (the legalese will just creep in)–
but liberty to come and go, to graze
and browse, to look about and birth, need be,
their young within remaining poplar bluffs
without a by-your-leave. Perhaps they feel
that we, Johnnies-come-lately, have to be
endured and, with familiarity,
in time will be fit audience for them!

But I was saying that the deer on this
old farm, deserted now except for my
own strolling on the trail across it, are
plain curious, simply inquisitive,
of my beholding them. Sometimes I come
across one feeding, head half-hidden in
the roadside grass. The wind is right this warm
spring day, with cooling drops of rain, and I
press forwards till I freeze at the twitching tail

and upraised head. The animal, alert,
his neck outstretched, sees me, yet not
alarmed–
he’s seen me more than once before–advances
in my direction, step by cautious step.
And then, as if for show, he leaps sideways
(a rainbow-arch abutted in some trees),
stands gazing there to see if he were seen.

Another time another deer, a doe,
is browsing at the far end of a bush
where roses grow (it is the rose leaves she
is eating); I again am walking down
the trail. The evening air is redolent
of musky odours, of the roses mixed
with remnant silver-leafed wolf willow. But
a quirk is in me–I am determined just
this once to be no audience for deer,
but looking ever up and onwards at
the luminescent skies becoming dusk,
my step unwavering to the west. Yet now
a sideways glimpse reveals the doe has come
from out behind the bush’s shelter into
the open field to better see my own
(to her) strange conduct. I continue as
before, eyes front, until I reach the farm’s
west border. Then I swing about–the doe
is right behind me! Curious she well
may be, but maybe she is thinking too
of status: some attention is her due.

- Victor C. Friesen



③ July 18 '92
Blue Hills

Mule deer ♀

The 1st ♀ jumped out of bed among thorn bush, cherry + ash trees along low bluff, bush about 15-20 ft wide. She stotted off 70 ft or so, then stood, part hidden to look back. She then trotted a further 50' or so, and stood at gaze, just like a ♀ kudu, with big ears + slender neck, for 2 mins then trotted off into coulee out of sight.

Mule deer, doe (?) watching me from cover.

Did not move whilst other 'Kudu' muledoe stotted out of bed in bush. I walked around within 20 ft of her, to front, she visible by pale looking verticals of inner legs visible through screening shrubs + small trees. I left her alone.

Kudu, The sle
great ears, The
Tsavo-like bushy
striped flanks
Convergent evo

© 1999 Paul Geraghty

NATURE SASKATCHEWAN NEWS

The Nature Saskatchewan awards and their recipients for 2008 are listed below.

Cliff Shaw Award

The Cliff Shaw award recipient for 2008 is **Frank Roy** for his CD review in September 2007 as well as other excellent reviews in past issues of *Blue Jay*: March 2007, March 2005 and December 2000.Frank Roy's reviews are informed, measured in their criticism, interesting and always a pleasure to read.

Conservation Award

Nature Saskatchewan's Conservation Award is presented each year to an individual or organization whose contribution to conservation is outstanding. The award may be presented for a specific project or conservation work over a period of years. Conservation Awards this year went to the **Saskatchewan Burrowing Owl Interpretive Centre** for over 10 years of conservation education, and **Lorne Scott** for his unparalleled efforts towards conservation (Figure 1). He has diligently pursued conservation for the past 50 years. This is a long term committment which was honored in

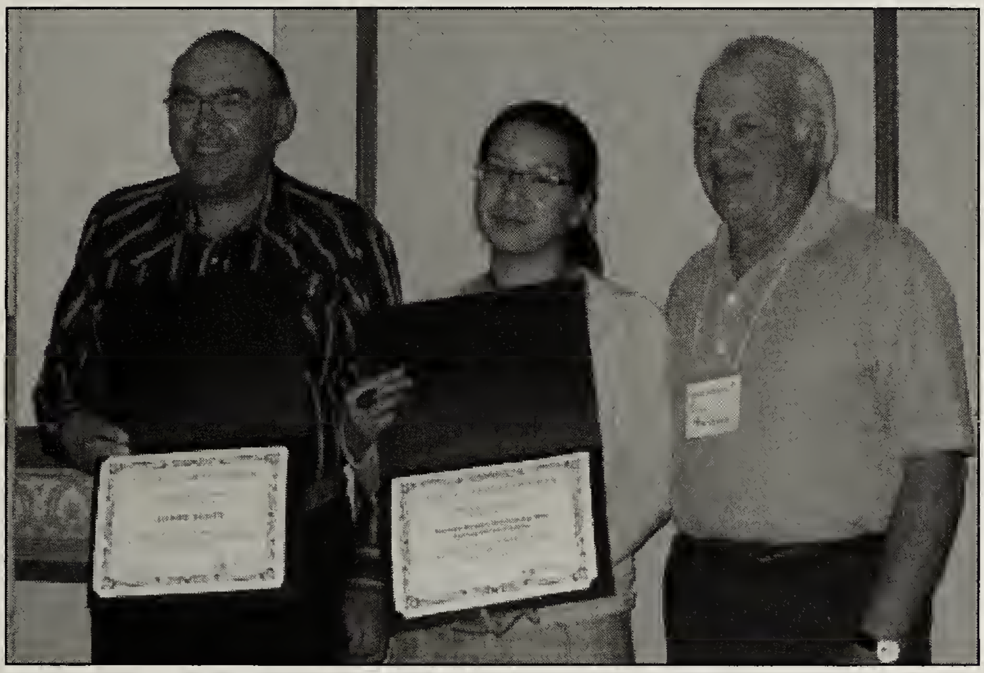


Figure 1. Lorne Scott and Janet Ng (on behalf of Saskatchewan Burrowing Owl Interpretive Centre) receiving conservation awards from Society President Bill MacKenzie.

Jacquie Bolton

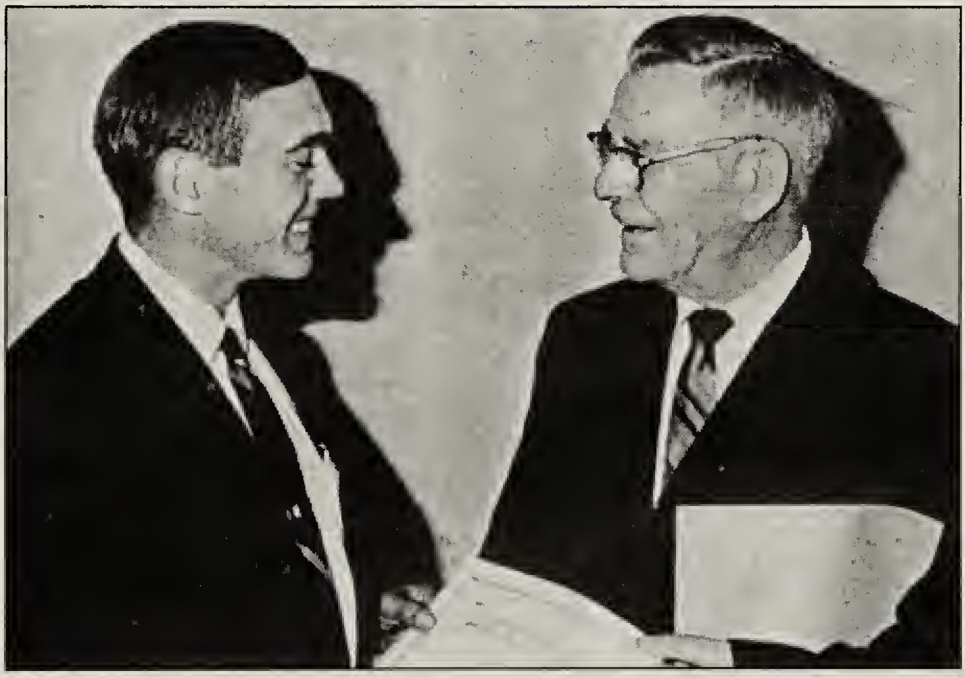


Figure 2. Lorne Scott accepting the 1969 SNHS Conservation Award from Society President W. A. Brownlee.

Gary Seib

1969 when he also received the award (Figure 2).

Fellows Award

Since 1987, the Society has designated members who have made a long and important contribution as "Fellows of the Saskatchewan Natural History Society." The Society recognizes two people with this award this year: **Margaret Skeel** for contributions to Nature Saskatchewan on Natural Heritage Programs and **Rob Warnock** for many years of Nature Views editing.

Larry Morgotch Memorial Photographic Award

Initiated by the Yorkton Natural History Society in memory of former member Larry Morgotch, this award is presented to the member showing the best photographs on Friday night at the Meet. This year's winner was **Don Matheson** (Figure 3) for his photographs of individual ducks taking off and landing.

Volunteer of the Year Award

This award acknowledges individuals who have devoted significant time and energy to promoting the objectives of the Society. This year's recipients are publications editors since all three are retiring: **Kim Dohms**, Nature Views editor; and **Anna and Ted Leighton** for 9 years editing Blue Jay.

Natural History Scholarships

The two recipients of scholarships in 2008 were **Nadia Mori** and **Kimberly Will**. Nadia Mori's research focuses on the role of grazing and fire in conserving biodiversity in Fescue Prairie. She is working towards a M.Sc degree in Plant Sciences at the University of Saskatchewan. Kimberly Will's research involves the control of leafy spurge infestation by cattle trained to graze on this invasive plant. She is working towards a M. Sc. degree in Agriculture and Bioresources at the University of Saskatchewan.

Long-term Service Award

This award is presented to an individual who has made an ongoing contribution to the society through his or her volunteerism and energy. Two Long Term Service Awards were granted this year: one to **Mary and Stuart Houston** for their many, valuable contributions to Nature Saskatchewan and the other to **Brian Jeffrey** for many years helping in the office and at Nature Saskatchewan Meets.

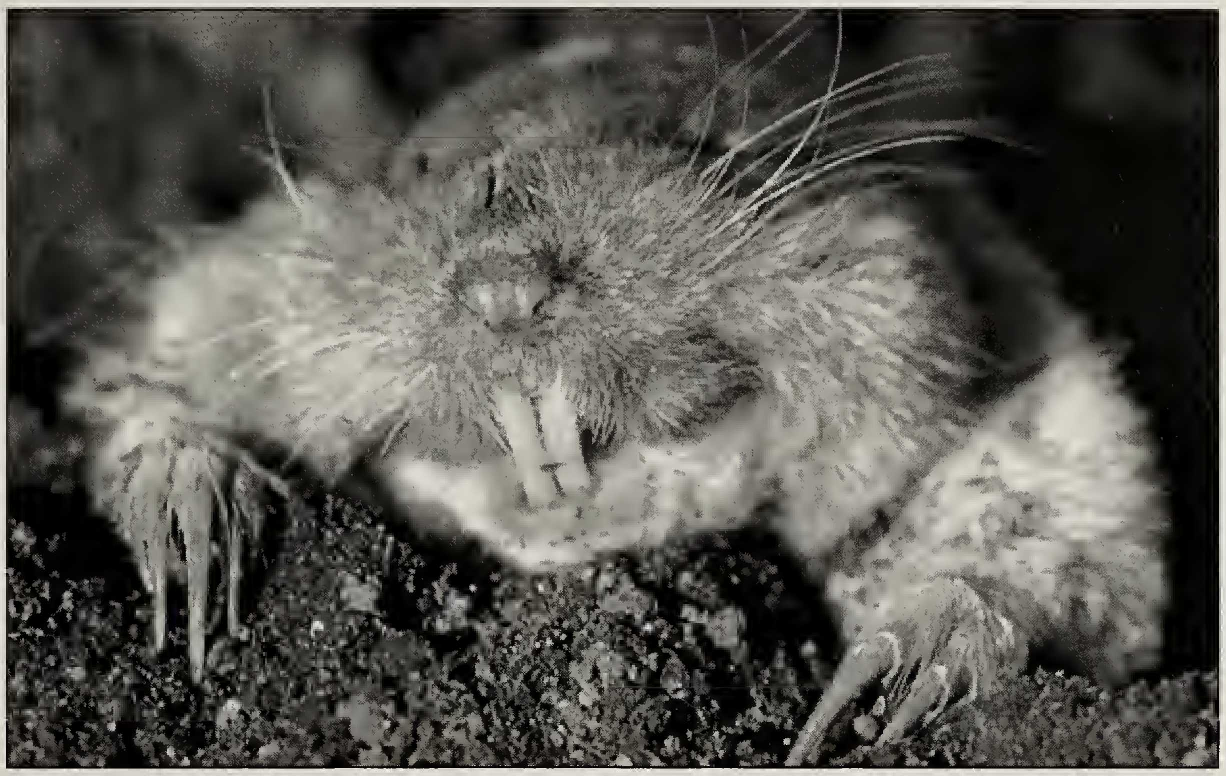
Don Matheson receiving the Larry Morgotch Memorial Photographic Award from Bill MacKenzie.

Jacquie Bolton

MYSTERY PHOTO

DECEMBER 2008 MYSTERY PHOTO

What prairie dwelling animal is this and for what feature visible in this photgraph is it named? (Photograph by Wayne Lynch)



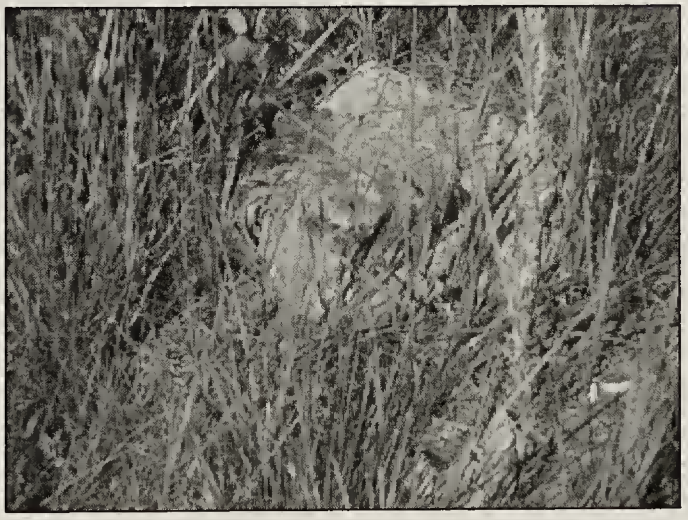
ANSWER TO THE SEPTEMBER 2008 MYSTERY PHOTO

What is on top of what in the photograph of incredible animal camouflage shown in colour on the back cover of the September issue? As described by Bob Godwin who took the photograph: "It is an almost fully grown Common Nighthawk on a dried cow-pie. Its feathers so perfectly match the cow-pie that I can't help but think that the young nighthawks evolved to hide on bison patties. The bird was actually longer than the diameter of the cow-pie. To stay concealed on the cow-pie the young bird was along the edge of the patty with its tail bent to the side such that the tail remained over the patty rather than sticking off the edge.

"In the photo, the tail of the nighthawk is buff coloured and is covering the upper left part of the patty. The body, which is grey like the cow-pie itself, stretches across the bottom portion of patty. The wing feathers can be discerned pointing to the left at the left side of the bird just below the base of the tail. If you can pick this out, it is then possible to see how the tail is bent to the side."

This photograph was taken 6 August 2004 in the Lomond PFRA Pasture.

The editors would like to thank Bob for submitting the photograph and the answers (as well as seeing the bird in the first place!)



INDEX

2008 INDEX TO AUTHORS AND ILLUSTRATORS

Alvo, Robert. Answer to June 2008 Mystery Photo, note 189
Artuso, Christian. Photo. Eurasian Collared-Dove 143
Asai, Juhachi. Photos. Mormon Metalmark, June inside back cover; Monarch butterfly with Monarch Watch tag on hind wing, September inside back cover
Barber, David R. Map. Fall migration route of a recently-fledged Turkey Vulture 149
__ See Houston, C. Stuart
Bazin, Ron. Update on Cattle Egret and White-faced Ibis Breeding Activity at Whitewater Lake, MB in 2007 75-77
__ Photo. White-faced Ibis, immature 75
Beyersbergen, G.W. Breeding and Range Expansion of the White-faced Ibis in Saskatchewan and Alberta 31-34
__ Cattle Egrets and Nests Found during Franklin's Gull Surveys in Saskatchewan in 2006 and 2007 70-69
__ Photos. Comparison of Franklin's Gull and White-faced Ibis eggs with mystery eggs (six photos), March inside back cover; White-faced Ibis nests 32, 33; Cattle Egret nests in willow 71; Cattle Egret nests with eggs (two photos) 72; Cattle Egret nest with young 72
Bildstein, Keith I. See Houston, C. Stuart
Blom, Michael. See Houston, C. Stuart
Bolton, Jacquie. Photos. Presentation of the 2008 Nature Saskatchewan Conservation Awards 239; Presentation of the 2008 Larry Morgotch Memorial Photographic Award 240
Bradatsch, Lucille. Answer to March 2008 Mystery Photo, note 125
__ Photo. Tree trunk chewed by beavers 60, 125
Brooks, Susan. Monarchs in my Milkweed 175-176
__ Photos. Monarch larva in the first crop, June 175; Second generation Monarch chrysalis, August 176
Carey, Brad. Northern Harrier - Bald Eagle Interaction, note 50
Clarke, Jared B. Raptors Nesting in Wascana Park, Regina 206-208
__ Photos. Cooper's Hawk chicks in nest 206; American Kestrel, adult female 207; Cooper's Hawk, adult female 208
__ and Kristen A. Martin. Two Common Raven Nests near Regina, note 56
Clarke, Maurice. Boreal Owl at Dewberry, AB, note 118
__ Photo. Boreal Owl 118
Cornelson, Brad. Photo. Boreal Owl 51
Davis, Bob. Photo. Mourning Dove with straw impaled in feathers 130
de March, Larry. Photos. Gray Treefrogs, posed to illustrate variation in colour and markings, March back cover; Buckeye, ventral view, June inside back cover; Broad-tailed Hummingbird, September inside front cover
__ See Taylor, Peter
Dodgson, Deanna. Photo. Cackling Goose 141
Duncan, Jim. Photo. Brown Creeper in tree hole 125, 189
Eade, Austin. Photo. Beetle impaled by Loggerhead Shrike 54
Epp, Henry. Book review. The Great Sand Hills Regional Environmental Study: Final Report. THE GREAT SAND HILLS SCIENTIFIC ADVISORY COMMITTEE. 179-184
__ Photo. North-facing view from the east shore of Crane Lake in the southern part of the Great Sand Hills 179
Fargey, Patrick. See Henderson, Allison
Friesen, Victor C. Poems. Beachcomber 95; Adaptation: Kangaroo Rat 147; Displacement 225; Deer 236-237

Geraghty, Paul. Field Sketches: Ross's and Snow Geese 159; Black-crowned Night-Heron and Mink 160-161; Blue Geese 162; Bohemian Waxwings 202; Mule Deer 238
Gjetvaj, Branimir. Photo. The Great Sand Hills in southwestern Saskatchewan, September front cover
Godwin, Bob. Answer to September 2008 Mystery Photo, note 241
__ Photo. Young Common Nighthawk on dried cow-pie, September back cover, 241
Gollop, Mike and Anna Leighton. Results of the 2008 International Butterfly Count in Saskatchewan 226-232
Gordon, Jeffrey A. Photo. Black-tailed Gull 142
Gould, Joyce. Book review. Wildflowers of the Rocky Mountains. SCOTTER, FLYGARE. 57-58
Granger, Morag. Photo. Long-eared Owl 177
Harms, Vernon L. The Native Currants and Gooseberries (*Ribes* Species) in Saskatchewan 163-174
Hecker, Kerry. Photos. Cattle Egret nest with eggs 197; Comparison of Cattle Egret egg and Black-crowned Night-Heron egg 198; Cattle Egrets with buffy plumes on back of head, December inside back cover
__ and Philip S. Taylor. Recent Cattle Egret Breeding Records for the Last Mountain Lake Area, Saskatchewan 196-202
Henderson, Allison. Photos. Branched Umbrella Plant (*Eriogonum pauciflorum*) 105; Rubber Rabbitbrush (*Ericameria nauseosa*) 105
__ Patrick Fargey, Shelly Pruss and Felix Sperling. Early Sighting of a Rare Butterfly, Mormon Metalmark, in Grasslands National Park, SK 105-106
Hlasny, Ron. See Parker, Dale
Holroyd, Geoffrey L. and Helen Trefry. The Travels of a Short-eared Owl Equipped with a Satellite Transmitter in Canada 28-30
__ See Priestley, D. Lisa
Holtorf, Della. Photo. Turkey Vulture on a TV antenna 2
Houston, C. Stuart
__ and Robert W. Nero. Ralph D. Carson, 1938-2007, in memoriam 187-188
__ David R. Barber, Brenton Terry, Marten J. Stoffel, Michael Blom, James Mandel and Keith I. Bildstein. Hourly Distances and Altitudes of a Recently-fledged Turkey Vulture on its First Southbound Migration 148-158
Houston, Mary I. and Robert W. Nero. Frank Henry Brazier, 1913-2004, in memoriam 122-124
Huebert, Brian. Photo. Eurasian Siskin, September inside front cover
Johanson, Robert E. See Smith, Alan R.
Johnson, Lois. Spring 2008–A Devastating Time for Mountain Bluebirds on the Prairies 209-210
__ Photo. Male Mountain Bluebird missing tarsi and feet 209
Koes, Rudolf F. Additions to the Bird List of Manitoba (1997-2007) 139-147
Kotlar, Joseph. Photo. Cattle Egret chicks on stick nest 200
Kotylak, Andrea. Photos. Baby garter snake impaled by Loggerhead Shrike 54; House Sparrow head impaled by Loggerhead Shrike 55
Kozial, John. Photos. Close-up of male Polyphemus Moth antennae 194; Group of Old World Swallowtails and Canadian Tiger Swallowtails 231; Aberrant form of Arctic Fritillary 232; Atypically scarlet leaves of Trembling Aspen (*Populus tremuloides*), December back cover
Krivda, Walter. Change in Populations of Cattails in Manitoba, note 178
__ Pink Lady's-slipper Population at Reed Lake, MB, note 52-53
__ Showy Lady's-slipper, *Cypripedium reginae*, in Disturbed Habitat at The Pas, MB, note 178
Lawrence, John and Bonnie. Answer to December 2007 Mystery Photo, note 61
__ Photo. Wingmarks and hole made by Redpoll emerging from snow bank 61
Leighton, Anna. Photos. *Ribes glandulosum* 165; *Ribes hudsonianum* 166
__ and Ted Leighton. Editors' Messages: *Blue Jay* and Natural History 67-69; 195
__ See Gollop, Mike
Luterbach, Bob. Eastern Wood-Pewee Nest in Southeastern Saskatchewan 158
Lynch, Wayne. Photos. Snowshoes, December front cover; December 2008 Mystery Photo 241
MacMaster, Ardythe. Photo. Bearberry (*Arctostaphylos uva-ursi)* in fruit, December inside front cover
Mandel, James. See Houston, C. Stuart
Martin, Kristin A. See Clarke, Jared B.

McCulloch, Randy. Photos. Short-eared Owl, March front cover; Kelly Peacock photographing Snow Buntings 26; Short-eared Owl with vole 30; Barn Swallow gathering mud for nest 124
Neimanis, Aleksija. West Nile Virus in Wild Birds in Saskatchewan: Summary of an Outbreak Year and Potential Impacts on Birds 112-116
Nero, Robert (Bob) W. Poem. Turnaround 188
__ See Houston, C. Stuart
Parker, Dale. Photo. *Leptophlebia nebulosa*, adult male 102
__ Ron Hlasny and Jeff Webb. Biodiversity and Adult Emergence Periods of Mayflies (Ephemeroptera) Inhabiting Candle Lake, SK 96-104
Peacock, Kelly. Photo. Snow Buntings, March inside front cover
Peterson, Gale. Photo. Headless mouse impaled by Loggerhead Shrike 55
Priestley, Chuck E. Photo. Tyler and Logan Flockhart, and Lisa Priestley at Francis View Point, Beaverhill Lake 132
__ See Priestley, D. Lisa
Priestley, D. Lisa. Photo. Stephie Valdez and Buttons standing in Foxtail Barley seed piles at Beaverhill Lake 135
__ Geoffrey L. Holroyd and Chuck E. Priestley. Short-eared Owl Invasion at Beaverhill Lake, AB, Winter 2005-2006 131-138
Pruss, Shelly. See Henderson, Allison
Raitt, David. Cliff-nesting Barn Swallows 78-81
__ Photos. Barn Swallow building nest on cliff face, June inside front cover; Barn Swallow nests built on cliffs (three photos) 78-79
Robson, Diana Bizecki. Book review. Orchids of Manitoba: A Field Guide. AMES et al. 120-121
__ The Prairie Goosefoots 82-95
__ The Saltbushes (*Atriplex*) of the Prairie Provinces 211-225
__ Drawings. *Chenopodium subglabrum* 83; vertical and horizontal goosefoot fruits 86; saltbush fruiting bracteoles 216; saltbush leaf shapes 217
__ Photo. Saline marsh near West Shoal Lake MB, typical Saltbush habitat 212
Romanchuk, Gerald. Photos. Five Short-eared Owls on fence 131; Short-eared Owl diving at Snowy Owl 137
Romo, Jim. Photos. Nuttall's Saltbush (*Atriplex gardneri* var. *gardneri*, *A. nuttallii*) 211; Garden Orache (*Atriplex hortensis*), December inside back cover
Roy, J. Frank. Audio CD review. Bird Songs of the North American Prairie. NEVILLE. 184-186
Rushbrooke, Ron. Garden Visitor near Indian Head, note 177
__ Photo. Long-eared Owl 177
Sanders, Claire. Photo. Cricket impaled by Loggerhead Shrike 55
Saunders, Nick. Photos. Townsend's Solitaire 8; Glaucous Gull swallowing fish (two photos) 23; Black-backed Woodpecker 25; White-tailed Jack Rabbit 35; Brown Thrasher, June front cover; Sharp-tailed Grouse, June back cover; Scissor-tailed Flycatcher, December inside front cover; Common Raven 253
Scott, Carol. Book review. Ecology, Conservation, and Status of Reptiles in Canada. SEBURN, BISHOP (eds.) 233-235
Scott, Ken. Bird Behaviour: Northern Goshawk, Common Raven and American Crow, note 117
Seib, Gary. Photo. Presentation of the 1969 Saskatchewan Natural History Society Conservation Award 239
Smith, Alan R. 35th Annual Saskatchewan Christmas Mammal Count-2007 35-43
__ and Philip S. Taylor. First Record of Cassin's Vireo for Saskatchewan 73-75
__ and Robert E. Johanson. 66th Annual Saskatchewan Christmas Bird Count-2007 3-27
Smith, Donald. Bird Sightings near Mossbank, SK, note 50-51
Sperling, Felix. See Henderson, Allison
Stiles, Donald J. An Alberta Banded Tree Swallow Recovered in East Texas, note 52
Stoffel, Marten J. See Houston, C. Stuart
Taylor, Peter. An Extraordinary Raven Nest 203-205
__ Northward Range Extension for the Gray Treefrog in West-central Manitoba 44-49
__ Photos. Gray Treefrog, resting posture, March inside front cover; Gray Treefrog habitat 46; Common Buckeye, dorsal view, June inside back cover; Cackling Geese and Ross's Geese 139; Extraordinary Common Raven nests (three photos) 203-205
__ Larry de March and A. Richard Westwood. Extended Range and Flight Period of the Common

Buckeye Butterfly in Southern Manitoba 107-111
Taylor, Philip S. Photos. Cassin's Vireo, side and back views (two photos), June inside front cover
__ See Hecker, Kerry
__ See Smith, Alan R.
Terry, Brenton. See Houston, C. Stuart
Tosh, George. Photo. Mountain Bluebird 210
Trefry, Helen. See Holroyd, Geoffrey L.
Warnock, Robert G. Book reviews. Birder's Conservation Handbook: 100 North American Birds at Risk. WELLS. 58-59; Raptors of Western North America. WHEELER. 119-120
Webb, Jeff. See Parker, Dale
Weidl, Don. Photo. Bison 36
Westwood, A. Richard. See Taylor, Peter
Yaskowich, Michelle. Prey Impaled by Loggerhead Shrikes, note 53-55
__ Photo. Wood Frog impaled by Loggerhead Shrike 54
Zazelenchuk, Dan. Photos. Freshly killed Least Weasel found in Great Horned Owl's nest 66; Long-eared Owl hiding behind young owls 177; Bullsnake 235

2008 SUBJECT INDEX

Alberta
  Beaverhill Lake
    Short-eared Owl Invasion at Beaverhill Lake, AB, Winter 2005-2006 PRIESTLEY, HOLROYD, PRIESTLEY 131-138
  Dewberry
    Boreal Owl at Dewberry, AB CLARKE 118

Amphibians
  Distribution
    Northward Range Extension for the Gray Treefrog in West-central Manitoba TAYLOR 44-49
  Particular Species
    Treefrog, Gray
      Northward Range Extension for the Gray Treefrog in West-central Manitoba TAYLOR 44-49

Birds
  Banding and Tagging
    An Alberta Banded Tree Swallow Recovered in East Texas STILES 52
    Hourly Distances and Altitudes of a Recently-fledged Turkey Vulture on its First Southbound Migration HOUSTON, BARBER, TERRY, STOFFEL, BLOM, MANDEL, BILDSTEIN 148-158
    The Travels of a Short-eared Owl Equipped with a Satellite Transmitter in Canada HOLROYD, TREFRY 28-30
  Behaviour
    Bird Behaviour: Northern Goshawk, Common Raven and American Crow SCOTT 117
    Northern Harrier - Bald Eagle Interaction CAREY 50
  Breeding Records and Distribution
    Breeding and Range Expansion of the White-faced Ibis in Saskatchewan and Alberta BEYERSBERGEN 31-34
    Eastern Wood-Pewee Nest in Southeastern Saskatchewan LUTERBACH 158
    Recent Cattle Egret Breeding Records for the Last Mountain Lake Area, Saskatchewan HECKER, TAYLOR 196-202
    Two Common Raven Nests near Regina CLARKE, MARTIN 56
    Update on Cattle Egret and White-faced Ibis Breeding Activity at Whitewater Lake, MB in 2007 BAZIN 75-77

Counts, Surveys and Checklists
- Additions to the Bird List of Manitoba (1997-2007) KOES 139-147
- Birder's Conservation Handbook: 100 North American Birds at Risk. WELLS. Book reviewed by WARNOCK 58-59
- 66th Annual Saskatchewan Christmas Bird Count-2006 SMITH, JOHANSON 3-27

Diet and Feeding
- Prey Impaled by Loggerhead Shrikes YASKOWICH 53-55

Diseases, Injuries and Abnormalities
- West Nile Virus in Wild Birds in Saskatchewan: Summary of an Outbreak Year and Potential Impacts on Birds NEIMANIS 112-116

Identification
- Bird Songs of the North American Prairie. NEVILLE. Audio CD set reviewed by ROY 184-186
- Raptors of Western North America. WHEELER. Book reviewed by WARNOCK 119-120

Migration
- An Alberta Banded Tree Swallow Recovered in East Texas STILES 52
- Hourly Distances and Altitudes of a Recently-fledged Turkey Vulture on its First Southbound Migration HOUSTON, BARBER, TERRY, STOFFEL, BLOM, MANDEL, BILDSTEIN 148-158

Mortality
- Spring 2008–A Devastating Time for Mountain Bluebirds on the Prairies JOHNSON 209-210

Movements
- The Travels of a Short-eared Owl Equipped with a Satellite Transmitter in Canada HOLROYD, TREFRY 28-30

Nests and Nesting
- An Extraordinary Raven Nest TAYLOR 203-205
- Cattle Egrets and Nests Found during Franklin's Gull Surveys in Saskatchewan in 2006 and 2007 BEYERSBERGEN 70-69
- Cliff-nesting Barn Swallows RAITT 78-81
- Raptors Nesting in Wascana Park, Regina CLARKE 206-208
- Recent Cattle Egret Breeding Records for the Last Mountain Lake Area, Saskatchewan HECKER, TAYLOR 196-202
- Two Common Raven Nests near Regina CLARKE, MARTIN 56

Particular Species
- Bluebird, Mountain
  - Spring 2008–A Devastating Time for Mountain Bluebirds on the Prairies JOHNSON 209-210
- Bluebird, Western
  - Bird Sightings near Mossbank, SK SMITH 50-51
- Crow, American
  - Bird Behaviour: Northern Goshawk, Common Raven and American Crow SCOTT 117
- Eagle, Bald
  - Northern Harrier - Bald Eagle Interaction CAREY 50
- Egret, Cattle
  - Cattle Egrets and Nests Found during Franklin's Gull Surveys in Saskatchewan in 2006 and 2007 BEYERSBERGEN 70-69
  - Recent Cattle Egret Breeding Records for the Last Mountain Lake Area, Saskatchewan HECKER, TAYLOR 196-202
  - Update on Cattle Egret and White-faced Ibis Breeding Activity at Whitewater Lake, MB in 2007 BAZIN 75-77
- Goshawk, Northern
  - Bird Behaviour: Northern Goshawk, Common Raven and American Crow SCOTT 117
- Harrier, Northern
  - Northern Harrier - Bald Eagle Interaction CAREY 50
- Hawk, Cooper's
  - Raptors Nesting in Wascana Park, Regina CLARKE 206-208

Ibis, White-faced
  Breeding and Range Expansion of the White-faced Ibis in Saskatchewan and Alberta BEYERSBERGEN 31-34
  Update on Cattle Egret and White-faced Ibis Breeding Activity at Whitewater Lake, MB in 2007 BAZIN 75-77
Jay, Blue
  Bird Sightings near Mossbank, SK SMITH 50-51
Kestrel, American
  Raptors Nesting in Wascana Park, Regina CLARKE 206-208
Merlin
  Raptors Nesting in Wascana Park, Regina CLARKE 206-208
Owl, Boreal
  Bird Sightings near Mossbank, SK SMITH 50-51
  Boreal Owl at Dewberry, AB CLARKE 118
Owl, Great Horned
  Raptors Nesting in Wascana Park, Regina CLARKE 206-208
Owl, Long-eared
  Garden Visitor near Indian Head RUSHBROOKE 177
Owl, Short-eared
  Short-eared Owl Invasion at Beaverhill Lake, AB, Winter 2005-2006 PRIESTLEY, HOLROYD, PRIESTLEY 131-138
  The Travels of a Short-eared Owl Equipped with a Satellite Transmitter in Canada HOLROYD, TREFRY 28-30
Raven, Common
  An Extraordinary Raven Nest TAYLOR 203-205
  Bird Behaviour: Northern Goshawk, Common Raven and American Crow SCOTT 117
  Two Common Raven Nests near Regina CLARKE, MARTIN 56
Shrike, Loggerhead
  Prey Impaled by Loggerhead Shrikes YASKOWICH 53-55
Solitaire, Townsend's
  Bird Sightings near Mossbank, SK SMITH 50-51
Swallow, Barn
  Cliff-nesting Barn Swallows RAITT 78-81
Swallow, Tree
  An Alberta Banded Tree Swallow Recovered in East Texas STILES 52
Vireo, Cassin's
  First Record of Cassin's Vireo for Saskatchewan SMITH, TAYLOR 73-75
Vulture, Turkey
  Hourly Distances and Altitudes of a Recently-fledged Turkey Vulture on its First Southbound Migration HOUSTON, BARBER, TERRY, STOFFEL, BLOM, MANDEL, BILDSTEIN 148-158
Wood-Pewee, Eastern
  Eastern Wood-Pewee Nest in Southeastern Saskatchewan LUTERBACH 158
Predators and Prey
Northern Harrier - Bald Eagle Interaction CAREY 50
Rarities
Boreal Owl at Dewberry, AB CLARKE 118
Cattle Egrets and Nests Found during Franklin's Gull Surveys in Saskatchewan in 2006 and 2007 BEYERSBERGEN 70-69
First Record of Cassin's Vireo for Saskatchewan SMITH, TAYLOR 73-75
Recent Cattle Egret Breeding Records for the Last Mountain Lake Area, Saskatchewan HECKER, TAYLOR 196-202
Update on Cattle Egret and White-faced Ibis Breeding Activity at Whitewater Lake, MB in 2007 BAZIN 75-77
Unusual Numbers
Short-eared Owl Invasion at Beaverhill Lake, AB, Winter 2005-2006 PRIESTLEY, HOLROYD, PRIESTLEY 131-138

In Memoriam
  Frank Henry Brazier, 1913-2004 HOUSTON, NERO 122-124
  Ralph D. Carson, 1938-2007 HOUSTON, NERO 187-188

Insects
  Counts, Surveys and Checklists
    Biodiversity and Adult Emergence Periods of Mayflies (Ephemeroptera) Inhabiting Candle Lake, SK PARKER, HLASNY, WEBB 96-104
    Results of the 2008 International Butterfly Count in Saskatchewan GOLLOP, LEIGHTON 226-232
  Flight Phenology
    Biodiversity and Adult Emergence Periods of Mayflies (Ephemeroptera) Inhabiting Candle Lake, SK PARKER, HLASNY, WEBB 96-104
    Early Sighting of a Rare Butterfly, Mormon Metalmark, in Grasslands National Park, SK HENDERSON, FARGEY, PRUSS, SPERLING 105-106
    Extended Range and Flight Period of the Common Buckeye Butterfly in Southern Manitoba TAYLOR, DE MARCH, WESTWOOD 107-111
  Particular Taxa
    Butterflies (Lepidoptera)
      Buckeye, Common (*Junonia coenia*)
        Extended Range and Flight Period of the Common Buckeye Butterfly in Southern Manitoba TAYLOR, DE MARCH, WESTWOOD 107-111
      Metalmark, Mormon (*Apodemia mormo*)
        Early Sighting of a Rare Butterfly, Mormon Metalmark, in Grasslands National Park, SK HENDERSON, FARGEY, PRUSS, SPERLING 105-106
      Monarch
        Monarchs in my Milkweed BROOKS 175-176
    Mayflies (Ephemeroptera)
      Biodiversity and Adult Emergence Periods of Mayflies (Ephemeroptera) Inhabiting Candle Lake, SK PARKER, HLASNY, WEBB 96-104
  Rarities
    Early Sighting of a Rare Butterfly, Mormon Metalmark, in Grasslands National Park, SK HENDERSON, FARGEY, PRUSS, SPERLING 105-106
    Extended Range and Flight Period of the Common Buckeye Butterfly in Southern Manitoba TAYLOR, DE MARCH, WESTWOOD 107-111

Mammals
  Counts, Surveys and Checklists
    35th Annual Saskatchewan Christmas Mammal Count-2007 SMITH 35-43

Manitoba
  Reed Lake
    Pink Lady's-slipper Population at Reed Lake, MB KRIVDA 52-53
  The Pas
    Showy Lady's-slipper, *Cypripedium reginae*, in Disturbed Habitat at The Pas, MB KRIVDA 178
  Whitewater Lake
    Update on Cattle Egret and White-faced Ibis Breeding Activity at Whitewater Lake, MB in 2007 BAZIN 75-77

Mystery Photos
  Answers to: December 2007 Mystery Photo 61; March 2008 Mystery Photo 125; June 2008 Mystery Photo 189; September 2008 Mystery Photo 241

Nature Library
  Birder's Conservation Handbook: 100 North American Birds at Risk. WELLS. Book reviewed by WARNOCK 58-59
  Bird Songs of the North American Prairie. NEVILLE. Audio CD set reviewed by ROY 184-186

Ecology, Conservation, and Status of Reptiles in Canada. SEBURN, BISHOP (eds.). Book reviewed by SCOTT 233-235
Orchids of Manitoba: A Field Guide. AMES et al. Book reviewed by ROBSON 120-121
Raptors of Western North America. WHEELER. Book reviewed by WARNOCK 119-120
The Great Sand Hills Regional Environmental Study: Final Report. THE GREAT SAND HILLS SCIENTIFIC ADVISORY COMMITTEE. Report reviewed by EPP 179-184
Wildflowers of the Rocky Mountains. SCOTTER, FLYGARE. Book reviewed by GOULD 57-58

Nature Saskatchewan
  Awards and Honours, 2008
    Cliff Shaw Award 239
    Conservation Award 239
    Fellows Award 240
    Larry Morgotch Memorial Photographic Award 240
    Long-term Service Award 240
    Natural History Scholarship 240
    Volunteer of the Year Award 240
  Publications - *Blue Jay*
    Editors' Messages: *Blue Jay* and Natural History LEIGHTON, LEIGHTON 67-69; 195

People and Societies
  Brazier, Frank Henry
    Frank Henry Brazier, 1913-2004 HOUSTON, NERO 122-124
  Carson, Ralph D.
    Ralph D. Carson, 1938-2007 HOUSTON, NERO 187-188
  Dohms, Kim
    Nature Saskatchewan 2008 Volunteer of the Year Award 240
  Houston, Mary
    Nature Saskatchewan 2008 Long-term Service Award 240
  Houston, Stuart
    Nature Saskatchewan 2008 Long-term Service Award 240
  Jeffrey, Brian
    Nature Saskatchewan 2008 Long-term Service Award 240
  Leighton, Anna
    Nature Saskatchewan 2008 Volunteer of the Year Award 240
  Leighton, Ted
    Nature Saskatchewan 2008 Volunteer of the Year Award 240
  Matheson, Don
    Nature Saskatchewan 2008 Larry Morgotch Memorial Photographic Award 240
  Mori, Nadia
    Nature Saskatchewan 2008 Natural History Scholarship 240
  Roy, Frank
    Nature Saskatchewan 2008 Cliff Shaw Award 239
  Saskatchewan Burrowing Owl Interpretive Centre
    Nature Saskatchewan 2008 Conservation Award 239
  Scott, Lorne
    Nature Saskatchewan 2008 Conservation Award 239
  Skeel, Margaret
    Nature Saskatchewan 2008 Fellows Award 240
  Warnock, Rob
    Nature Saskatchewan 2008 Fellows Award 240
  Will, Kimberly
    Nature Saskatchewan 2008 Natural History Scholarship 240

Plants
- ***Counts, Surveys and Checklists***
  - The Native Currants and Gooseberries (*Ribes* Species) in Saskatchewan HARMS 163-174
  - The Prairie Goosefoots ROBSON 82-95
  - The Saltbushes (*Atriplex*) of the Prairie Provinces ROBSON 211-225
- ***Identification***
  - Orchids of Manitoba: A Field Guide. AMES et al. Book reviewed by ROBSON 120-121
  - The Native Currants and Gooseberries (*Ribes* Species) in Saskatchewan HARMS 163-174
  - The Prairie Goosefoots ROBSON 82-95
  - The Saltbushes (*Atriplex*) of the Prairie Provinces ROBSON 211-225
  - Wildflowers of the Rocky Mountains. SCOTTER, FLYGARE. Book reviewed by GOULD 57-58
- ***Particular Taxa***
  - Cattails (*Typha angustifolia* and *Typha latifolia*)
    - Change in Populations of Cattails in Manitoba KRIVDA 178
  - Currants and Gooseberries (*Ribes* spp.)
    - The Native Currants and Gooseberries (*Ribes* Species) in Saskatchewan HARMS 163-174
  - Goosefoots (*Chenopodium* spp.)
    - The Prairie Goosefoots ROBSON 82-95
  - Lady's-slipper, Pink (*Cypripedium acaule*)
    - Pink Lady's-slipper Population at Reed Lake, MB KRIVDA 52-5
  - Lady's-slipper, Showy (*Cypripedium reginae*)
    - Showy Lady's-slipper, *Cypripedium reginae*, in Disturbed Habitat at The Pas, MB KRIVDA 178
  - Saltbushes (*Atriplex* spp.)
    - The Saltbushes (*Atriplex*) of the Prairie Provinces ROBSON 211-225

Poetry
- Adaptation: Kangaroo Rat FRIESEN 147
- Beachcomber FRIESEN 95
- Deer FRIESEN 236-237
- Displacement FRIESEN 225
- Turnaround NERO 188

Reptiles
- ***Counts, Surveys and Checklists***
  - Ecology, Conservation, and Status of Reptiles in Canada. SEBURN, BISHOP (eds.). Book reviewed by SCOTT 233-235

Saskatchewan
- Candle Lake
  - Biodiversity and Adult Emergence Periods of Mayflies (Ephemeroptera) Inhabiting Candle Lake, SK PARKER, HLASNY, WEBB 96-104
- Grasslands National Park
  - Early Sighting of a Rare Butterfly, Mormon Metalmark, in Grasslands National Park, SK HENDERSON, FARGEY, PRUSS, SPERLING 105-106
- Great Sand Hills
  - The Great Sand Hills Regional Environmental Study: Final Report. THE GREAT SAND HILLS SCIENTIFIC ADVISORY COMMITTEE. Report reviewed by EPP 179-184
- Indian Head
  - Garden Visitor near Indian Head RUSHBROOKE 177
- Last Mountain Lake
  - Recent Cattle Egret Breeding Records for the Last Mountain Lake Area, Saskatchewan HECKER, TAYLOR 196-202

- Mossbank
  - Bird Sightings near Mossbank, SK SMITH 50-51
- Regina
  - Raptors Nesting in Wascana Park, Regina CLARKE 206-208
  - Two Common Raven Nests near Regina CLARKE, MARTIN 56

2008 ILLUSTRATION INDEX

All illustrations are photographs unless otherwise indicated

Amphibians
- Frog, Wood: impaled by Loggerhead Shrike, YASKOWICH 54
- Treefrog, Gray: resting posture, TAYLOR March inside front cover; variations in colour and markings, DE MARCH March back cover

Bird Nests and Eggs
- Eggs of Cattle Egret and Black-crowned Night-Heron: HECKER 198
- Eggs of Franklin's Gull, White-faced Ibis and probable Franklin's gull: BEYERSBERGEN March inside back cover (six photos)
- Nest of Cooper's Hawk: with chicks, CLARKE 206
- Nests of Barn Swallows on cliffs: with eggs, RAITT 78; nest sites (two photos), RAITT 79
- Nests of Cattle Egret: nests in willow, BEYERSBERGEN 71; nests with eggs (two photos), BEYERSBERGEN 72; nest with young, BEYERSBERGEN 72; nest with eggs, HECKER 197; stick nest with young, KOTLAR 200
- Nests of Common Raven: extraordinary structures, TAYLOR 203, 204, 205
- Nests of White-faced Ibis: with newly hatched young, BEYERSBERGEN 32; with eggs and newly hatched young, BEYERSBERGEN 33

Birds
- Bluebird, Mountain: male missing tarsi and feet, JOHNSON 209; TOSH 210
- Buntings, Snow: PEACOCK March inside front cover; winter flock, McCULLOCH 26
- Collared-Dove, Eurasian: ARTUSO 143
- Creeper, Brown: with head in tree hole, DUNCAN 125, 189
- Dove, Mourning: with straw impaled in feathers, DAVIS 130
- Eagle, Golden: mounted, 187
- Egret, Cattle: three chicks on stick nest, KOTLAR 200; adults with buffy plumes on back of head, HECKER December inside back cover
- Flycatcher, Scissor-tailed: SAUNDERS December inside front cover
- Golden-Plover, American: diorama at Provincial Museum of Alberta (now known as the Royal Alberta Museum), September inside back cover
- Goose, Cackling: TAYLOR 139; DODGSON 141
- Goose, Ross's: TAYLOR 139; drawing, GERAGHTY 159
- Goose, Snow: drawing, GERAGHTY 159; Blue Goose variant, drawing, GERAGHTY 162
- Grouse, Sharp-tailed: males charging each other, SAUNDERS June back cover
- Gull, Black-tailed: GORDON 142
- Gull, Glaucous: swallowing fish, SAUNDERS 23
- Hawk, Cooper's: chicks in nest, CLARKE 206; adult female, CLARKE 208
- Hummingbird, Broad-tailed: DE MARCH September inside front cover
- Ibis, White-faced: immature, BAZIN 75
- Kestrel, American: adult female, CLARKE 207
- Nighthawk, Common: Young bird on dried cow-pie, GODWIN September back cover, 243
- Night-Heron, Black-crowned: drawing, GERAGHTY 160
- Owl, Boreal: CORNELSON 51; CLARKE 118
- Owl, Long-eared: GRANGER 177; RUSHBROOKE 177; with young, ZAZELENCHUK 177
- Owl, Short-eared: McCULLOCH March front cover; with vole, McCULLOCH 30; five along a fence line, ROMANCHUK 131; diving at Snowy Owl, ROMANCHUK 137
- Owl, Snowy: ROMANCHUK 137
- Raven, Common: SAUNDERS 253

- Redpoll: wingmarks and hole made by bird emerging from snow bank, LAWRENCE 61
- Siskin, Eurasian: HUEBERT September inside front cover
- Solitaire, Townsend's: SAUNDERS 8
- Sparrow, House: head impaled by Loggerhead Shrike, KOTYLAK 55
- Swallow, Barn: building nest on cliff face, RAITT June inside front cover; gathering mud for nest, McCULLOCH 124
- Thrasher, Brown: SAUNDERS June front cover
- Vireo, Cassin's: side and back views (two photos), TAYLOR June inside front cover
- Vulture, Turkey: on TV antenna, HOLTORF 2
- Waxwing, Bohemian: drawing, GERAGHTY 202
- Woodpecker, Black-backed: SAUNDERS 25

Habitat

- Gray Treefrog habitat: TAYLOR 46
- Great Sand Hills: GJETVAJ September front cover; shrubland and stabilized grass-covered dunes, EPP 179
- Saltbush habitat: saline marsh, ROBSON 212
- Winter scene: snowshoes, LYNCH December front cover

Insects

- Beetles (Coleoptera)
  - Beetle: impaled by Loggerhead Shrike, EADE 54
- Butterflies and Moths (Lepidoptera)
  - Buckeye, Common (*Junonia coenia*): ventral view, DE MARCH June inside back cover; dorsal view, TAYLOR June inside back cover
  - Fritillary, Arctic: aberrant form, KOZIAL 232
  - Metalmark, Mormon (*Apodemia mormo*): ASAI June inside back cover
  - Monarch: larva, BROOKS 175; chrysalis, BROOKS 176; with Monarch Watch tag, ASAI September inside back cover
  - Moth, Polyphemus: close-up of male antennae, KOZIAL 194
  - Swallowtails, Old World and Canadian Tiger: KOZIAL 231
- Grasshoppers and Crickets (Orthoptera)
  - Cricket: impaled by Loggerhead Shrike, SAUNDERS 55
- Mayflies (Ephemeroptera)
  - *Leptophlebia nebulosa*: adult male, PARKER 102

Mammals

- Beaver: tree trunk chewed by beavers, BRADATSCH 60, 125
- Bison: WEIDL 36
- Deer, Mule: drawing, GERAGHTY 238
- Jack Rabbit, White-tailed: SAUNDERS 35
- Mink: with duckling, drawing, GERAGHTY 160-161
- Mouse: impaled by Loggerhead Shrike, PETERSON 55
- Weasel, Least: freshly killed, ZAZELENCHUK 66

People

- Brazier, Frank Henry: 122
- Brownlee, W.A.: presenting the 1969 Saskatchewan Natural History Society Conservation Award, SEIB 239
- Carson, Ralph D.:187
- Flockhart, Tyler and Logan: PRIESTLEY 132
- MacKenzie, Bill: presenting the 2008 Nature Saskatchewan Conservation Awards, BOLTON 239; presenting the 2008 Larry Morgotch Memorial Photographic Award, BOLTON 240
- Matheson, Don: accepting the Larry Morgotch Memorial Photographic Award, BOLTON 240
- Ng, Janet: accepting (on behalf of Saskatchewan Burrowing Owl Interpretive Centre) the 2008 Nature Saskatchewan Conservation Award, BOLTON 239
- Peacock, Kelly: photographing Snow Buntings, McCULLOCH 26
- Priestley, Lisa: PRIESTLEY 132
- Scott, Lorne: accepting the 2008 Nature Saskatchewan Conservation Award, BOLTON 239; accepting the 1969 Saskatchewan Natural History Society Conservation Award, SEIB 239
- Valdez, Stephie: in Foxtail Barley seed piles, PRIESTLEY 135

Plants
Aspen, Trembling (*Populus tremuloides*): atypically scarlet leaves, KOZIAL December back cover
Barley, Foxtail (*Hordeum jubatum*): seed piles at Beaverhill Lake, PRIESTLEY 135
Bearberry (*Arctostaphylos uva-ursi*): in fruit, MacMASTER December inside front cover
Currants and Gooseberries (*Ribes* spp.): leaf shapes, 164; generalized flower parts, drawing, 165; *Ribes glandulosum*, LEIGHTON 165; *Ribes hudsonianum*, LEIGHTON 166; six Saskatchewan *Ribes* species, drawing, 172
Goosefoots (*Chenopodium* spp.): *Chenopodium subglabrum*, drawing, ROBSON 83; vertical and horizontal fruits in the goosefoot genus, drawing, ROBSON 86
Rabbitbrush, Rubber (*Ericameria nauseosa*): HENDERSON 105
Saltbushes (*Atriplex* spp.): Nuttall's Saltbush (*Atriplex gardneri* var. *gardneri, A. nuttallii*): ROMO 211; fruiting bracteoles, drawing, ROBSON 216; leaf shapes, drawing, ROBSON 217; Garden Orache (*Atriplex hortensis*): ROMO December inside back cover
Umbrella Plant, Branched (*Eriogonum pauciflorum*): HENDERSON 105
Reptiles
Bullsnake: ZAZELENCHUK 235
Snake, Garter: impaled by Loggerhead Shrike, KOTYLAK 54
Research Apparatus
Mayfly emergence trap: 99

Common Raven *Nick Saunders*

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